

City of Dover, N.H.

Master Plan



Transportation

October, 2000

Submitted by:

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City of Dover Master Plan

This chapter of the City of Dover Master Plan is intended to set policies and goals while providing a comprehensive vision for transportation. It is a required element of the Master Plan as revised by the Planning Board in 2000 and was prepared by Strafford Regional Planning Commission (SRPC) under contract to the City of Dover.

The City of Dover's transportation planning and implementation is based upon a common **vision and principle** that:

Dover will invest in, maintain and properly manage or regulate a coordinated, safe, efficient and effective transportation system that promotes the long-term goals of its citizens and businesses expressed in this Master Plan. The City acknowledges this system to consist of



public and private infrastructure such as roads, bridges, sidewalks, parking facilities, trails and transit centers as well as services such as transit, taxis and traveler information resources. This system will enhance the quality of life for residents and the quality of experience for visitors and tourists while preserving the character and strategic advantages of the City for current and future generations.

In order to move towards this vision, the City of Dover seeks to adopt policies, amend regulations, develop short and long-term plans and implement projects which individually and collectively:

- Provide **mobility, accessibility and transportation options** to all residents and visitors.

- Promote **commerce, tourism and recreation** by integrating multiple land uses and transportation modes mindful of our historic development patterns.

- Promote **affordable, interconnected and convenient mass transportation systems** through:
 - Coordination between municipal, public and private providers
 - Development that maximizes access to mass transportation
 - Provision of accessible, public trails, sidewalks, and roads
 - Ongoing fiscal support of transit services

- Enable ongoing review and update of **flexible Site Review and Subdivision Regulations and Zoning Ordinances** that accommodate efficient operations and promote wise land use, creative design, and a sense of community rather than disconnection between people.

- **Facilitate expansion and reuse of the downtown** core through mixed use development patterns and projects which reduce the need for vehicular use, promote pedestrian activity and experiences and create a positive, safe and welcoming environment. The transportation system will also acknowledge, plan for and provide a market based supply of convenient and adequate parking facilities.

- **Create a managed transportation system** that secures and allocates maximum available City, State and Federal resources to the best use for all residents and visitors. City staff and elected officials will conduct ongoing reviews and coordination of expenditures and develop short and long-term improvement plans that improve transport, promote economic development, utilize new technologies and enhance the livability of our community.

- **Promote a transportation system that supports and encourages full revitalization and use of our waterfront** with full access to recreational and transportation uses of the Cochecho River.

- **Incorporate all compatible transportation modes within the existing street network** whenever and wherever possible.

- **Respect the limit of existing neighborhood street capacities** based on safety, character, noise, and any other factors that affect the livability of the community.

- **Create long-term funded plans** that provide for:
 - Necessary improvements and/or adjustments to traffic patterns
 - Well-designed and convenient parking in the downtown using market-based strategies and demand management
 - Enhancement of non-vehicular transportation modes including sidewalks, bike trails, and walking trails
 - Ongoing maintenance and reinvestment in streets, highways and bridges under the City's jurisdiction

- Identify and plan to maximize opportunities **to develop or preserve transportation corridors for future use.**
- Promote transportation systems that **maximize safety for all users**, respect neighborhoods and their residents, and facilitate commerce.
- **Require all City departments** including Police, Community Services, School and Planning **to work cooperatively and in a coordinated fashion** to focus efforts on safety for all users of the transportation system.
- Promote a transportation system that is fully integrated into, supports and benefits from the **regional transportation system and planning process.**
- Promote a transportation system that **attracts and retains industry** to appropriately zoned areas of the City and which promotes compatible uses throughout. Identify appropriate corridors to provide access to industrial and commercially zoned land that currently has no access or inadequate access.
- **Direct development to major transportation corridors** using dynamic ordinances, zoning, and regulations and **exact appropriate incremental contributions for development impacts** on the transportation system.
- **Discourage development that occurs prematurely outside the urban core** or off of current major transportation corridors.

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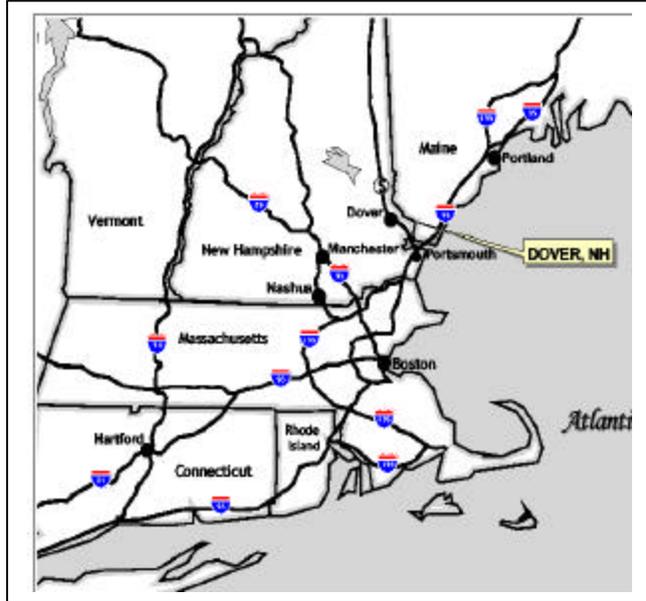
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Abbreviations

ADA	Americans with Disabilities Act of 1990
ADT/AADT	Average Daily Traffic / Average Annual Daily Traffic
CAAA	Clean Air Act Amendments of 1990
CBD	Central Business District
CIP	Capital Improvements Program
CFR	Code of Federal Regulations
CMAQ	Congestion Mitigation/Air Quality Program
COAST	Cooperative Alliance for Seacoast Transportation
CTPP	Census Transportation Planning Package
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FY	Fiscal Year
GACIT	Governor's Advisory Committee on Intermodal Transportation
GIS	Geographic Information System
HPMS	Highway Performance Monitoring System
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITS	Intelligent Transportation Systems
LOS	Level Of Service
MPO	Metropolitan Planning Organization
NHDOT	New Hampshire Department of Transportation
NNEPRA	Northern New England Passenger Rail Authority
PDA	Pease Development Authority
ROW	Right of Way
RSMS	Road Surface Management System
SIP	State Implementation Plan (for Air Quality Conformity)
STIP	Statewide Transportation Improvement Program
SRPC	Strafford Regional Planning Commission
TAC	Technical Advisory Committee
TE	Transportation Enhancement
TDM	Transportation Demand Management
TEA-21	Transportation Efficiency Act for the 21 st Century
TIP	Transportation Improvement Program
UNH	University of New Hampshire - Durham
UPWP	Unified Planning Work Program
VMT	Vehicle Miles Traveled

Introduction

The City of Dover is located in the Coastal core of northern New England. It has excellent ties to the region's rail, highway, airport and maritime transportation corridors. It is within 75 miles of three major regional airports and within 65 miles of the Cities of Boston, Concord, Portland, and Burlington. Locally, Dover has excellent access to the Spaulding Turnpike, which serves as a bypass around the Downtown. The City has five exits on the Turnpike. It is bisected by Guilford Transportation's Main-Line rail corridor and also features two major river corridors.



As highlighted in the demographic sections of the Master Plan, the City of Dover's population estimate for 2000 is 27,205 and has been growing at an average annual rate of about 1% over the last 20 years. By the Year 2020, the population is projected to reach 31,704¹.

Similarly, traffic has increased at an average annual rate of about 2% over the same twenty-year period. Slow steady growth may not seem like a catastrophic problem, but it will cause additional delays for roads and intersections already experiencing congestion even with road widening projects. Additionally, unexpected changes in population growth or the economy may add more traffic stress.

In the last three years of the 1990's, the economy in the Seacoast has grown at a rate much faster than the twenty year average. As shown in this section, traffic volumes on major roads in Dover and the surrounding area grew at over 5% per year in the late 90's. This rate of growth is outpacing the planned infrastructure expansion and causing both opportunities and challenges for the City and the region. Other factors such as automobile ownership rates, the increasing number of workers per family household, the increasing dispersion of our activity centers and an increasing jobs-housing mismatch create more trips per household than in previous decades.



The Transportation Chapter of the Master Plan is developed to establish policies and priorities to maintain and improve the transportation system. By adopting this Chapter, the City seeks to proactively work to improve the system, providing for future growth and maintaining the quality of life in Dover. The City policies established in this document are intended to be comprehensive, but also dynamic, and will be revised as needed to adapt to the changing climate of the region. A comprehensive transportation system that considers all users and their range of needs and preferences will make for a more enjoyable experience for residents, visitors and tourists of the City. This will be essential to other aspects of the City's health, including economic development, environmental

¹ Source for population estimates: Seacoast MPO 1999-2020 Long Range Transportation Plan based on NH Office of State Planning projections. 2020 Population estimate based upon linear growth rate based on real growth rate from 1970 to 1995.

protection, and recreation opportunities. Dover's participation in such programs as the Main Street Program, as well as the City's plan for the redevelopment of the riverfront area, the soon to be constructed downtown Intermodal Transportation Center, and relocation of the court building are examples of the kind of vision for the future that will lead to a better Dover.

The City's population, economy and development trends are dynamic. Accordingly, the policies in this Chapter will be implemented through ongoing planning and Ordinance review. City officials and staff will use the policies in this document to guide ongoing development, use of City resources and implementation of projects and programs. This document defines a vision and sets overall policy.

Sound planning for Dover's transportation system requires looking at the system as a whole. This section attempts to do just that, by assessing existing conditions of facilities and service of all major transportation modes and facets of the transportation system in Dover. Issues addressed in this section include Air Transportation, Commuter Patterns, Bicycle Facilities, Parking, Pedestrian, Rail, Ridesharing, Roads and Highways, and Transit.



The City has a strong base in most of these areas from which to continue its efforts to formulate a balanced and functional transportation system. Some modes have been neglected or over-emphasized during different eras in the City's 350-year history. Over the course of this period, the City's transportation modes and its orientation have been shaped by the rivers, the rail lines and, over the past 50 years, predominantly by the highway and the private automobile. This document looks toward the future. For the purposes of this chapter, each category of facilities and services outlines the existing conditions of that particular mode of transportation, if applicable, describes methodology used in the assessment and

concludes with remarks about the findings and recommendations. These sections are in alphabetical order with no preference given to one mode versus another. This is to stress the fact that all of these modes have their place in a complete, optimal transportation system.

TRANSPORTATION PLANNING PROCESS AND PROJECTS

The City of Dover is has been very successful in identifying, planning and funding improvements in its transportation system. This is especially the case with the procurement of federal and state matching funds for improvements. A review of the 1988 Master Plan shows many of the priority projects of that day are now successfully completed. Since that time over \$9 million of federal funds have been accessed for system improvements. This success is due to an ongoing local planning process that has identified deficiencies, sought available federal, state and private funding and then successfully raised City funds for implementation. This process requires an on-going and proactive planning program that starts at the community and Planning Board level and ends in staff efforts to oversee implementation. For larger projects, the timeline from problem identification to resolution may take many years since funding is often necessary from State and Federal funding sources. For many small, neighborhood projects the process can be as quick as an effective interdepartmental communication and a cooperative building season. This section outlines the transportation planning process in the City of Dover and recommends policies and procedures to maintain Dover's successful procurement of federal and state funds for future transportation system improvements. It also advocates for consistent and increased investment in the City's transportation infrastructure to maintain and improve current standards and options.

The City of Dover Transportation Improvement Program (TIP) Process

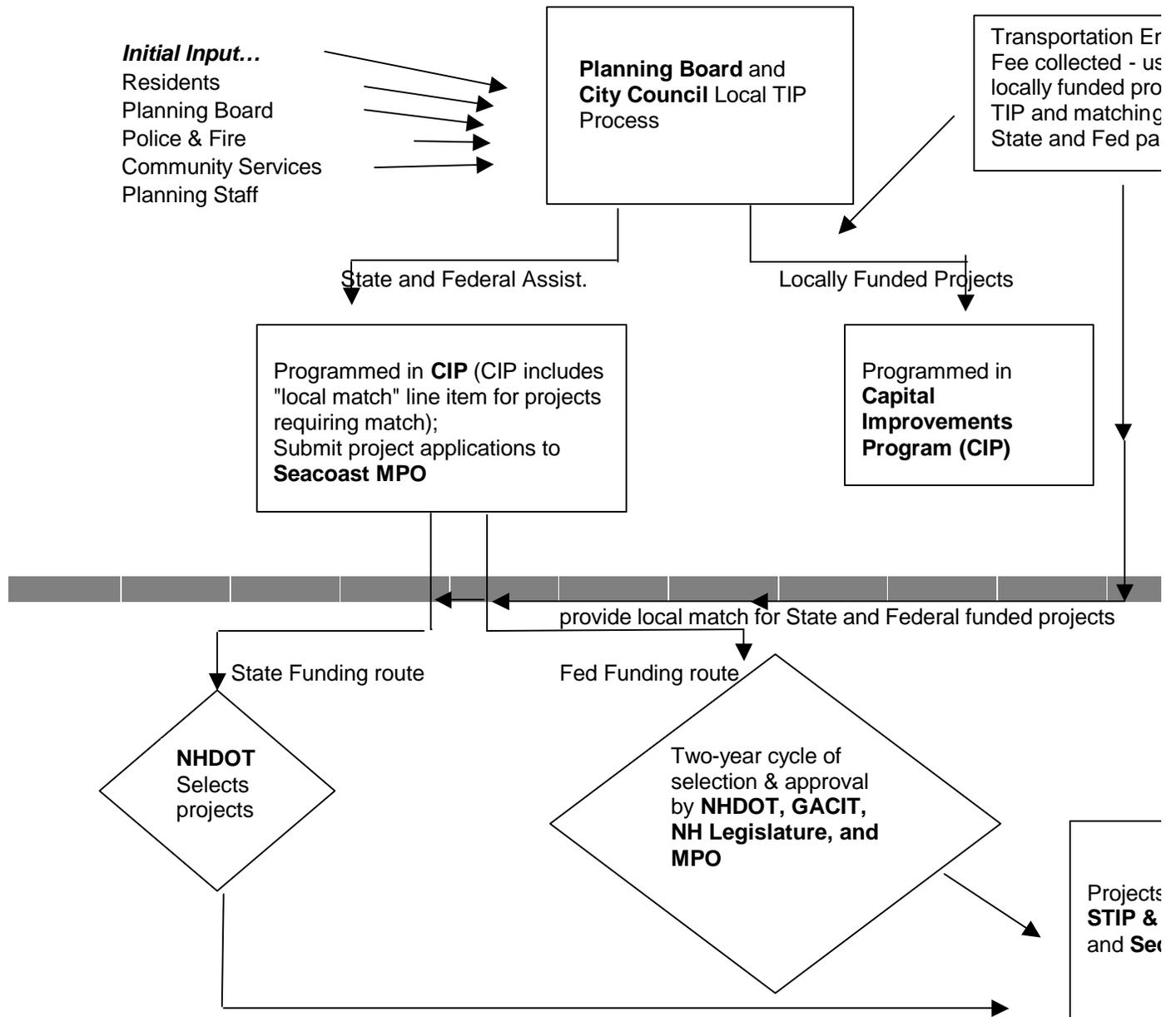
The City of Dover follows a local Transportation Improvement Program (TIP) which is the ongoing, formal process used to identify, prioritize and select projects for various funding categories. This process is done biennially in a manner in an effort to coordinate it with the regional and state process of selecting projects for state and federal funding. This process is initiated by the Planning Board as part of the Dover Capital Improvement Program (CIP).

The biennial process begins with public input through a citizen's forum, as well as with input from the City Planning Board and staff (Police, Planning, Fire and Community Services). The Planning Board takes the pool of projects that are recommended through the various sources and prioritizes them in order of need, in relation to previously identified or committed projects. The Planning Board then forwards this prioritized list of projects to the City Council with recommendations for adoption. This prioritized list of transportation projects is adopted for inclusion in the Dover CIP/TIP and, where appropriate, (projects seeking federal or state funding) forwarded into the Seacoast Metropolitan Planning Organization (MPO) project funding process.

Many local projects such as sidewalk and crosswalk repairs, street resurfacing and reconstruction, signage, lighting and parking are dealt with entirely at the local CIP level. The amount of funding in the CIP determines the number of projects completed in a given year. Large construction projects that are completely within the City's jurisdiction may be bonded over several years. The City Council ultimately determines the amount of funding available for the CIP based upon the overall budget and tax rate.

The Transportation Planning Process - how an idea becomes reality

A flow chart outlining the process can be found in **Diagram T - 1 Dover Transportation Project Funding Cycle**. This section also outlines the various places for the public to become involved in this process and become part of the effort to shape the future for a better transportation system in Dover. The most current example of the **City of Dover TIP** is included in the Technical Appendices accompanying this document and a list of project recommendations pending at the time of this publication follows.



Funding Transportation Projects

Many larger transportation projects, and those which are more regional in nature, are often facilities that are eligible for state or federal funding sources. Those funding sources come from numerous combinations of State and Federal gas tax receipts, Federal allocations, state allocations, auto registration fee returns and US Congressional apportionments. In most cases, the Federal or state government pays a portion of the project cost (usually 50-80%) and the local community pays the remainder (often called the "local match"). Many highway projects fall on State owned facilities. Outside of the downtown area, or more specifically, the urban compact shown on **Map T-2 Road System**, the State is responsible for the local match or the entire cost of the project. Inside the urban compact area, the City is responsible for, and often owns and maintains the facility and is responsible for the cost of maintenance and sometimes reconstruction. In exchange for this responsibility, the City receives funding from the state in the form of a highway block grant each year.

In addition, the City collects a local auto registration fee of \$4.00 per vehicle/per year (called the Transportation Enterprise Fund), which is maintained in a local account for use on eligible transportation expenses, including matches on larger projects or full costs of smaller projects. No administrative charge is subtracted from this fee so the full amount is deposited into a special account earmarked for use on local transportation improvement projects. This fund is incorporated into the local Transportation Improvement Program process that is portrayed in the flow chart **T-1 Dover Transportation Project Funding Cycle** on page 4.

With approximately 25,000 registered vehicles in the city, this fee has the potential to increase revenues up to \$100,000 per year. This allows Dover to address many small-scale improvements, as well as take full advantage of State and Federal funding opportunities requiring local match. With population and vehicle miles traveled increasing in the across the region and in Dover, this program has the potential to continue to grow over time. Other local sources of funds for the transportation system include the general fund, parking fees, motor vehicle violation fees and developer impact fees.

Transportation Enterprise Fund - Auto Registration Fee

In 1998, Dover voted to institute a local fee collected with motor vehicle registrations. Effective in the fall of 1999, this fee is collected from both commercial and passenger vehicles, with the exception of all-terrain vehicles, antique motor vehicles and motorcycles. The money collected through this fee is earmarked as a specific source of funding for transportation related projects. The money can be used for any type of project ranging from sidewalks, road improvements, transit service or many other transportation related expenditures. This money can be used as the sole funding source for a project. However, one of the key aspects of this fund is that it provides Dover with an additional source of matching funds for available State and Federal funding sources. The Federal and State funding sources typically require a minimum of approximately 20 to 30 percent local match. Often times this match is difficult to raise through the City's General Fund or other fund sources within the City. This can lead to missed funding opportunities. This fund helps ensure that Dover can continue to aggressively pursue State and Federal funding sources requiring a local match. Since its effective start date in November 1999, this fee has raised up to \$8,000/month, for a total of approximately \$35,000 in account to date. This money will be used directly on local transportation improvement projects within the City.

The Seacoast Metropolitan Planning Organization (MPO)

Projects that will require Federal, and increasingly State, funding must be submitted through the Strafford Regional Planning Commission (SRPC), which functions as the Federally required MPO for selecting and programming new projects. The MPO is responsible for ensuring the region meets the Federally required planning and air quality standards to receive Federal funding. This is no small amount of funding. In the most recent three-year Transportation Improvement Program (TIP for FY1999-2001) the region was estimated to receive \$273 million in federal transportation funding².

At the broadest level, Federal regulations and legislation, as well as State guidance, has instituted a formalized system to ensure a continuing, coordinated, and comprehensive regional transportation process. Funding for transportation projects is available through a variety of sources, including Federal money made available through the Transportation Equity Act for the 21st Century (TEA-21), as well as various State of New Hampshire programs. Dover has taken advantage of these funding opportunities, has completed many projects, and has more planned, ranging from sidewalk improvements to major intersection upgrades.

The MPO Project-Funding Process

Once Dover has completed the biennial update of its TIP, it begins the formal submittal of those projects that will require State or Federal funding to the MPO. In general, these projects are then entered into an 18-month competitive evaluation process for State and Federal funding. This process includes an active public participation and comment period, as well as ongoing staff review for air quality and general transportation system impacts. The projects are evaluated based upon a formally adopted set of criteria at the MPO level and are then ranked by the MPO and NHDOT in comparison to competing projects from the region and around the State. The MPO forwards the most highly rated projects of the region to the NHDOT which then works cooperatively with the MPOs, the Legislature and the Governor's Office to select projects which will be placed into the New Hampshire Ten Year Program and the long-range 20 year programs of the State and the Seacoast MPO.

Projects move from the Long Range Plans to the Ten Year Program and eventually into the committed three-year (State/MPO) Transportation Improvement Program (TIP). Projects that are in the TIP have guaranteed funding. Projects in the NH Ten Year Program are expected to be funded, but are subject to reevaluation every two years. Projects in the long-range MPO and State Plans are considered eligible for possible future funding selection pending reevaluation.

² Source: SRPC Historical TIP Comparison, 1998

Seacoast MPO

The **Seacoast MPO** is the planning body responsible for implementing the transportation planning process for the New Hampshire portion of the Portsmouth-Dover-Rochester, NH-Maine urbanized area. The Strafford Regional Planning Commission, of which Dover is a member, and Rockingham Planning Commission have been jointly designated as the staff responsible for the administration of the MPO.

The MPO is responsible for the administration of funds and policies established through TEA-21, which was adopted in 1998. The MPO is also responsible for maintaining compliance with other Federal legislation, such as the Clean Air Act Amendments of 1990. These pieces of Federal legislation form the basis for much of the Federal funding available for transportation projects in the City of Dover.

The Seacoast MPO consists of a Policy Committee (the Regional Planning Commissioners) and a Technical Advisory Committee (TAC), which include professional planning staff. The MPO Policy Committee is charged with providing policy level recommendations, approvals and endorsements of the Seacoast MPO concerning transportation issues. The City of Dover is represented on this committee by its four Commissioners, who also serve as members of the Strafford Regional Planning Commission.

Projects not successfully funded through this application process may remain as project level recommendations in the MPO Long-Range Transportation Plan for future funding rounds but the Plan is subject to overall fiscal constraints based upon expected available Federal funds. The City may also attempt to secure funding through one of the other funding sources described below. In general, this Federal/State required process repeats itself every two years beginning in the fall of even calendar years.

Other Funding Sources

The projects funded through this biennial update process are, for the most part, oriented toward traditional highway improvements, such as intersection improvements, reconstruction of existing highways, widening of highways, transit system capital and operations and other projects eligible for Federal funds. While this funding covers many of the needed types of improvements to the transportation infrastructure, there are other funding sources available at the Federal level to implement local and regional transportation projects.

Transportation Enhancement (TE) and Congestion Mitigation and Air Quality (CMAQ)

Two other prominent Federal funding programs are the **Transportation Enhancement (TE)** and **Congestion Mitigation and Air Quality (CMAQ)** improvement funds. Like the Federal funds available through the TIP process, these programs require a local fund match of 20% of the total project cost, with the Federal portion consisting of 80%. These are statewide competitive funding programs. Dover has been aggressive in applying for these funds over the successive biennial rounds and has achieved great success in securing project funding. An increasing number of applications are seen in each round. To continue its success, the City of Dover must insure that all currently funded CMAQ and TE projects are implemented according to State and Federal guidelines and that new applications are fully matched and supported locally. **Table T-2 Dover Transportation Projects**, at the end of this section, presents some of Dover's successes in these funding rounds.

CMAQ and TE Funds

The City of Dover has been a strong participant in these federal funding categories. Funds from these categories are being used for projects such as the Intermodal Transportation Center, signal coordination on Central Avenue, and various bicycle and pedestrian related improvements around the City. See **Table T-2 Project Tables**, at the end of this section, for a listing of the City's success in securing funding in the latest CMAQ and TE funding rounds.

Projects eligible for **CMAQ** funds must show:

- A reduction in traffic congestion, as well as an improvement in associated air quality. A reduction in traffic congestion is demonstrated by a reduction in Vehicle Miles Traveled (VMT) as a result of the project, while the latter is expressed in a reduction in emissions generated.
- Projects funded through this mechanism traditionally are:
 - Transit expansions or new service and amenities or facilities;
 - Other shared ride: vanpool and carpool programs; and
 - Traffic management and control services, signalization and signal coordination projects, pedestrian and bicycle: sidewalks, trails, or bicycle storage facilities.

The **Transportation Enhancement Program** is a slightly less restrictive program in terms of eligibility. The projects must simply have a rational connection to the transportation system and must improve the overall community or transportation system.

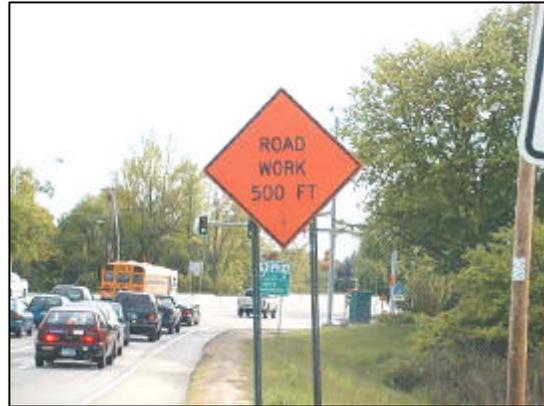
Projects eligible for **TE** funds must:

- Provide new transportation related facilities for bicyclists and pedestrians, or;
- Increase safety and/or improve educational programs for bicyclists and pedestrians, or;

- Improve amenities to the transportation system, including landscaping and other scenic beautification, historic preservation, control and removal of outdoor advertising, and preservation of abandoned railway facilities.

Other State Funding Sources

In addition to Federal funds available through the MPO processes described above, there are State funds that can be accessed through other mechanisms. Some of these include the **State Aid Bridge** and **State-Aid Highway** programs, **NH Betterment Program**, as well as formula highway block grant money distributed throughout the state.



State-Aid Highway Funds are available through the NHDOT, typically by contacting the NHDOT District offices in the region. Dover is part of the District 6 office located in Durham. Other state bridge and trail programs outside of the NHDOT are also available through the Department of Forestry and the Department of Resource and Economic Development. *Rules, application procedures and funding cycles for these State programs change frequently. City staff should coordinate their efforts through the Planning Department and work directly with the District Office and the Strafford Regional Planning Commission (SRPC).*

While these funds are not suitable for large-scale, expensive highway improvements, they are a mechanism to implement smaller projects sometimes in a shorter timeframe. While the typical project funded through the biennial TIP update process can take up to eight years to come to fruition, state funded projects can reach construction phase in as short as a few years. These funds also require a larger minimum match than the Federal funding mechanisms. State aid projects are typically a 1/3 local to 2/3 State funding split.

The **State-Aid Bridge Program** is a similar program specifically designed to address the upkeep of the many bridges of the State highway system. This program is administered through the NHDOT's central offices in Concord. Funding here is similar to the State -Aid Highway funds, typically requiring a 1/3 total project cost match to access 2/3 state funds. Funding availability is on a first -come first-serve basis.

Recommendations

In general, Dover has been very active in participating in the project identification, development and funding process. It has had many successes in obtaining funding at all levels, from Federal Transportation Enhancement funds to local State Highway Betterment funding. Of particular note is Dover's exemplary local Transportation Improvement Program (TIP) development process. This local process, which mimics the Federally-mandated MPO project identification process, is unparalleled in the Strafford Regional Planning Region. This process has provided the citizens of Dover with added opportunities to participate in the identification of transportation issues and offer solutions for the City. It has also been successful from the MPO standpoint in providing an organized flow of projects that can feed into the biennial MPO TIP update process.

The next step is to connect this process more closely to the general population of the City. It has been noted that the City of Dover has a Parking and Safety Committee that is not fully integrated into this planning process. That Committee should be reformulated by the City Council to address the full span of Transportation and Safety issues in the City. The Committee should be redesigned with a new mission and should be advertised to the Community at large. This Committee would then become integrated into the suggestions listed below:

- *Continue to be persistent in pursuing funds from sources such as Federal Transportation Enhancement (TE) and Congestion Mitigation and Air Quality (CMAQ) improvement programs. Successful funding of these types of projects will continue to allow Dover to keep the mix of transportation improvements balanced, with due attention given to the lesser utilized modes of transportation such as bicycle and pedestrian. The City should prioritize its applications through the local TIP process and develop no more than three solid, well-supported applications in each funding cycle. It should also be prepared to advocate and present on behalf of those applications before the State selection Committees.*
- *In addition to the funding sources described in this section, The City should consider impact fees when feasible and appropriate. As developers implement projects that have an identifiable impact on the surrounding transportation system, a fee should be exacted. This fee would be used towards offsetting impacts of the development in the form of roadway, intersection and related improvements.*
- *When appropriate and feasible, continue to pursue State funded programs or local bonding as a means of expediting projects that would normally take longer through the federal funding channels. Federally funded projects, while often requiring a lower minimum local match of 20%, generally take many more years to implement.*
- *The City Manager should formalize a semi-annual staff meeting with the department heads from Planning, Community Services, Police and Fire Departments to review all pending transportation related or funded projects in progress. This Transportation Team Coordination meeting would also prioritize and coordinate all new project suggestions.*
- *The City Manager should hold at least one Community Forum, per year, that allows residents to address and have input in transportation improvement projects. This forum would address small neighborhood needs as well as larger City related issues. This meeting would provide the City Manager with direct input regarding transportation and safety related issues. It should be attended by members of the Transportation Coordination Team, who should report on the status of projects in the City.*
- *The City, through its Commissioners and staff, should remain actively engaged in the Seacoast MPO and should clearly and actively advocate for the interests of Dover and the Seacoast region of the state.*

Roads

There are approximately 154 miles of road within the City of Dover. The key component of Dover's road network is NH Route 16 - Spaulding Turnpike, which allows easy access to Portsmouth, Boston, Portland, and other cities throughout New England. The road network is portrayed on **Map T-2 - Road System**. The roads in Dover are classified into 6 classes under RSA 229:5. For ease of interpretation, the road map filters the system described below into the categories of State Maintained, City Maintained, Private, and Roads Not Regularly Maintained.

NHDOT CLASSIFICATION	DESCRIPTION	MILEAGE
Class I	Class I highways shall consist of all existing or proposed highways on the primary state highway system.	26.1
Class II	Class II highways shall consist of all existing or proposed highways on the secondary highway system.	3.5
Class III	Class III highways shall consist of all roads within State parks or reservations.	0.0
Class IV	Class IV highways consist of all highways within the compact section of cities and towns listed in RSA 229:5, V. (Urban Compacts)	62.9
Class V	Class V highways shall consist of all other open and traveled roads, which the municipality has the duty to regularly maintain and shall be known as town roads.	55.8
Class VI	Class VI highways shall consist of all other existing public right-of-ways, and shall include highways that are discontinued or subject to gates and bars.	6.0
TOTAL		154.3

Source: NHDOT Planning Department, 2000

The NHDOT Urban Compact is also represented on the Road Base Map. The urban compact represents an area of roadway in which the City is responsible for maintenance, regardless of the classes described in the table below. The City receives block grant funding from State licensing and registration to apply toward the maintenance of the roadways.

Traffic Volumes

Over the past 20 years the City of Dover, SRPC, NHDOT, and various consultants, as part of Planning Board and Zoning Board proceedings, have conducted traffic volume counts throughout Dover. Last year alone, SRPC in cooperation with NHDOT, conducted as many as 33 traffic counts in Dover. These counts are generally conducted by placing an automatic traffic recorder at the desired location for a span of approximately one week. The data collected from these traffic volume counts are a valuable technical resource. Traffic volume data is helpful in performing the following analyses:

- Identification of existing peak hour traffic volumes
- Determine current roadway or level of service (LOS) rating
- Track growth rates of traffic volumes to aid in prediction of problem areas
- Input data for Road Surface Management System (RSMS) process

For a representation of traffic volumes at various locations within the City of Dover, see **Map T-3 Traffic Volume**. A table of this data with location description and exact average daily traffic (ADT) volumes is available in the technical appendices accompanying this document.

Historical Traffic Growth Patterns

In addition to the short-term traffic counts described above, NHDOT has placed permanently fixed traffic volume recorders at various locations throughout the State. In Dover, there are permanent counters on Dover Point Road and on the Spaulding Turnpike at the Dover Tolls. There is also a permanent counter located on the Spaulding Turnpike at the General Sullivan Bridge. While this location is not technically in Dover, it provides valid data for the traffic traveling the portion of the Spaulding that traverses that southern portion of the City. Analysis of the data collected by these permanent counter

Traffic Volumes - "ADT"

Traffic volumes are often referred to in terms of ADT or average daily traffic volume. This refers to the quantity of cars crossing a defined location on a roadway in both directions. It is calculated by averaging a number of days over the course of a normal week of traffic flow.

locations reveal that traffic volumes around the region have generally increased at an average annual rate of approximately 2% per year. This is considered somewhat normal background traffic growth. However, in times of marked economic prosperity, such as the early eighty's and the present, the rate of increase in traffic growth is much steeper. Annual increases from 1997 to present have reached as high as 5 to 6% per year.³ This growth in traffic volumes is represented in the following graph. The table and graph below presents traffic volumes from the three permanent counters mentioned above, from 1960 to 1999.

Figure T-3 - Regional Traffic Growth

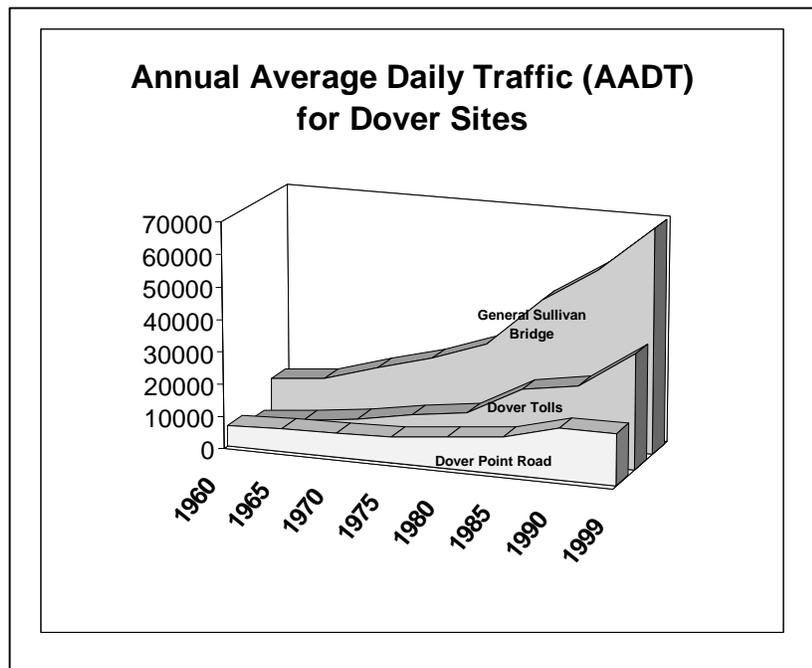
ADTs for NHDOT permanent counters						
	Dover Point	% Change	Dover Tolls	% Change	Gen. Sullivan Bridge	% Change
1960	6326		3350		11797	
1965	7050	10%	4977	33%	13613	13%
1970	7521	6%	7060	30%	18700	27%
1975	7989	6%	10100	30%	23153	19%
1980	9696	18%	12394	19%	29226	21%
1985	11430	15%	21372	42%	44633	35%
1990	15949	28%	24139	11%	55267	19%
1999	16040	1%	35573	32%	69541	21%

Source: NHDOT Traffic Data Office, 2000

Design Hour Traffic Volumes

Design of a road or highway is typically based on the 30th highest hour occurring during a year. It is not economically feasible to design improvements for extreme peaks that only occur a few times per year.

Whereas, a design for too frequent conditions leads to unacceptable and possible recurring traffic congestion. In a city like Dover with a combination of suburban and urban areas, the 30th highest hour provides a reasonable peak hour condition and is generally 10% to 12% of the AADT. A review of traffic data indicates that at most locations throughout Dover peak traffic volumes occurred between 4:30 PM and 5:30 PM.



³ Source: NHDOT permanent counter data - see technical appendices for more detail

Roadway Level of Service

There are several road segments, which during the 30th highest hour or peak hour, experience some amount of congestion. Road segment congestion is determined by peak hour traffic volume. Peak hour traffic volume is used to perform a Level of Service (LOS) analysis using the Highway Capacity Manual. LOS has 6 stages, ranging from “A” to “F”. LOS “A” is the best with little or no congestion and LOS “F”, the worst, with extreme delays and congestion.

LOS ratings are good indicators of what motorists may experience on a section of road, but has its shortcomings. One shortcoming is that LOS only portrays what a *motorist* may experience and has no relationship to what a pedestrian or bicyclist experiences. Another shortcoming of LOS is that it is based on research from suburban locations with little in common with urban settings. For streets in downtown Dover, such as Central Avenue, a poor LOS rating may not be inherently bad or correctable. Another shortcoming is in the application of an LOS rating. Once determined, LOS is used to ascertain an engineered solution and improvement to the LOS. Again this is exclusively for vehicle traffic. When applying an LOS rating the road’s location, possible resolutions, and other modes of transportation must be equally weighed in determining a logical solution.

Methodology and Analysis

Roadway LOS	CONDITION
A	Free-flow of traffic. Vehicles almost completely unimpeded in their ability to maneuver within the traffic stream.
B	Reasonably free-flow. The ability to maneuver within the traffic stream is only slightly restricted and the general level of physical and psychological comfort to drivers is still high.
C	Flow with speeds still at or near the free-flow speed of the highway. Freedom to maneuver within the traffic stream is noticeably restricted.
D	Speeds begin to decrease slightly with increasing flows. Freedom to maneuver within the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort levels.
E	Operation is generally at capacity. Virtually no gaps exist in the traffic stream. Maneuverability within the traffic stream is extremely limited, and the level of physical and psychological comfort afforded the driver is extremely poor.
F	Breakdown in vehicular flow. Queues form as a result of this breakdown of the capacity of the roadway to serve the volume of vehicles attempting to enter and use the section of roadway.

Source: Highway Capacity Manual, 1994

Using basic roadway capacity characteristics and available traffic volume data, levels of service (LOS) were estimated for various locations. The following **Table T-4 - Critical Corridors** highlights some of the road segments in Dover that experience problematic levels of congestion - typically a LOS of E or F or that have other issues that make them substandard by other criteria such as safety or aesthetics. **Map T-4 - Critical Corridors** portrays these corridors.

Table T-4 Critical Corridors

Location	Issues	Ongoing - Interim Needs	Next Step	Priority
<p>MAIN ST AND CENTRAL AVE BETWEEN BROADWAY AND WASHINGTON "CENTRAL LOOP"</p>	<ul style="list-style-type: none"> ▪ Maximize safe travel speeds and flow while maintaining community character ▪ Reduce downtown congestion ▪ Provide safe parking zones and pedestrian crossing areas 	<ul style="list-style-type: none"> ▪ Reassign 5 point intersection approach lanes ▪ Advance Signage ▪ Signal Upgrade at 5 point intersection ▪ Evaluate parking restrictions along portions of Main Street ▪ Balance traffic circulation with parking needs ▪ Control traffic speeds for safety 	<p>Hire consultant for full evaluation of downtown traffic circulation options. Evaluation should include bi-directional review and full build out of riverfront district</p>	<p>High</p>
<p>CENTRAL AVE FROM MAIN ST (WASHINGTON ST.) TO SILVER ST. INTERSECT WITH NH16 "LOWER CENTRAL"</p>	<ul style="list-style-type: none"> ▪ Maximize safe travel speeds and flow while maintaining community character ▪ Reduce downtown congestion ▪ Provide safe parking zones and pedestrian crossing areas 	<ul style="list-style-type: none"> ▪ Restripe and assign lanes on Central Ave northbound at the Main Street intersection to accommodate a northbound left turn ▪ Upgrade 5 point intersection signal and tie-in with signals south on Central Ave ▪ Create more visible pedestrian crossings and control vehicle speed ▪ Evaluate widening Silver Street to accommodate an additional NB turn lane near NH16 interchange 	<p>Analyze land allocation and striping in southbound direction - check for possibility of 2 lanes southbound</p> <p>Include in downtown traffic circulation study scope (see above)</p>	<p>High</p>
<p>INDIAN BROOK DRIVE (SIXTH STREET EXTENSION) FROM WEEKS CROSSING TO SIXTH STREET</p>	<ul style="list-style-type: none"> ▪ Accommodate westbound traffic flows and access to Spaulding southbound 	<ul style="list-style-type: none"> ▪ Plan for expanding cross section to two lanes in each direction. Upgrade Spaulding access and signalization ▪ Collect developer impact fees for immediate development 	<p>Advocate as necessity in any Exit 10 improvement scheme</p>	<p>High</p>
<p>LOCUST ST FROM CENTRAL AVE TO WASHINGTON ST</p>	<ul style="list-style-type: none"> ▪ Road surface and markings 	<ul style="list-style-type: none"> ▪ Needs major reconstruction, utility review and restriping to accommodate all users 	<p>Schedule for major reconstruction</p>	<p>High</p>
<p>OAK STREET FROM CENTRAL TO PORTLAND</p>	<ul style="list-style-type: none"> ▪ Accommodate safe pedestrian and bicycle use - standardize to intersections 	<ul style="list-style-type: none"> ▪ Portland intersection signalized in 1999 ▪ Broadway intersection scheduled for construction with sidewalk in 2000 ▪ Narrow corridor needs sidewalks 	<p>Explore options for ROW increase in Broadway to Portland Ave section for sidewalks and shoulder placement</p>	<p>High</p>

Table T-4 Critical Corridors

Location	Issues	Ongoing - Interim Needs	Next Step	Priority
<p>COUNTY FARM RD</p>	<ul style="list-style-type: none"> ▪ Poor road geometry and substandard road surface condition 	<ul style="list-style-type: none"> ▪ Minor realignments of Sixth Street and Watson Rd intersections completed. Sixth Street wired for signalization in mid 1990s. ▪ Any expanded use (municipal or private) in this section of Dover must include road upgrades and possible signalization at intersection with 6th Street. Signal warrant should be investigated as development occurs. See Intersection section for more on this topic. 	<p>City should evaluate reconstruction of bridge over Cocheco River. See Bridge section for more on this topic.</p>	<p>Med Bridge (Low)</p>
<p>CENTRAL AVE FROM OAK ST TO CHESTNUT ST <i>"UPPER CENTRAL"</i></p>	<ul style="list-style-type: none"> ▪ Maximize safe travel speeds and flow while maintaining community character 	<ul style="list-style-type: none"> ▪ Standardize Central Avenue lane widths and parking plan ▪ Normal maintenance and improvements around new Oak st. intersection ▪ Restripe and sign ▪ Evaluate widening option 	<p>Develop Central Ave policy for improvements – Fund Central Avenue Corridor Study</p>	<p>Medium</p>
<p>CENTRAL AVE FROM CHESTNUT ST TO BROADWAY <i>"MIDDLE CENTRAL"</i></p>	<ul style="list-style-type: none"> ▪ Maximize safe travel speeds and flow while maintaining community character ▪ Improve Chestnut St intersection 	<ul style="list-style-type: none"> ▪ Consider signalization of Chestnut St. ▪ Standardize Central Avenue lane widths and parking plan ▪ Normal maintenance only 	<p>Develop Central Ave policy for improvements – Fund Central Avenue Corridor Study</p>	<p>Medium</p>
<p>CHESTNUT ST. FROM WASHINGTON ST. TO CENTRAL AVE</p>	<ul style="list-style-type: none"> ▪ Maximize safe travel speeds and flow while maintaining community character ▪ Reduce downtown congestion and provide access to Intermodal Transportation Center ▪ Limit vehicular speeds and increase pedestrian crossing visibility 	<ul style="list-style-type: none"> ▪ Adjust signal timing along bypass route to encourage traffic flows" ▪ Coordinate signals in corridor and monitor First Street signal for removal – relocation to Second Street/Transit Center entrance ▪ Reevaluate Locust Street one-way pattern introduced north of City Hall 	<p>Ongoing staff evaluation and data collection – Monitor for additional needs</p>	<p>Medium</p>

Table T-4 Critical Corridors

Location	Issues	Ongoing - Interim Needs	Next Step	Priority
<p>NH 108 WEEKS CROSSING TO LONG HILL ROAD AND SOUTH TO GLENWOOD AVE</p>	<ul style="list-style-type: none"> ▪ Redevelopment will further reduce pedestrian safety and vehicular access to local neighborhoods 	<ul style="list-style-type: none"> ▪ City should coordinate work with NHDOT on Access Management and driveway permits and impose appropriate impact fee/improvements on new development. ▪ Access to neighborhoods should not be allowed to further deteriorate ▪ Bike lanes should be required ▪ Access management should be strictly enforced 	<p><i>Sidewalk construction along the north side of road programmed for 2001</i></p> <p>New access between NH 108 and NH 16B should be evaluated and constructed (opposite Willand Pond Rd)</p> <p>City should require corridor improvements as part of any Exit 10 strategy</p>	<p>Medium</p>
<p>HENRY LAW AVE</p>	<ul style="list-style-type: none"> ▪ Requires sidewalk along both sides of street – integrate into regional network 	<ul style="list-style-type: none"> ▪ Monitor riverfront redevelopment and include upgrade as development requirement. ▪ Resurface and reconstruct as necessary 	<p>2000 TE application for City not funded. Reapply next round or identify alternative funding source</p>	<p>Medium</p>
<p>NH 9 FROM NH 155 TO MADBURY T/L</p>	<ul style="list-style-type: none"> ▪ Accommodate existing and proposed industrial and residential development along both sides of NH Route 9 	<ul style="list-style-type: none"> ▪ NH 9 and NH 155 intersection upgraded in early 1990's ▪ Work with NHDOT to evaluate need for center turning lane west of Rail line to Columbus Ave. 	<p>City should reevaluate and withdraw past requests for Exit 8 A access.</p>	<p>Low</p>
<p>GLENWOOD AVE</p>	<ul style="list-style-type: none"> ▪ Relatively high volume through residential neighborhood as cut through from Sixth Street to Central Ave. 	<ul style="list-style-type: none"> ▪ Intersection with Sixth Street reconstructed in 1999 ▪ Resurface and reconstruct as necessary ▪ Implement Speed Management and neighborhood traffic calming strategies 	<p>Install formal bicycle lanes and speed control</p>	<p>Low</p>
<p>UPPER FACTORY ROAD SIXTH STEET TO COLUMBUS AVE</p>	<ul style="list-style-type: none"> ▪ None 	<ul style="list-style-type: none"> ▪ None 	<p>Evaluate future reconstruction and connection to Sixth Street</p>	<p>Low</p>

Table T-4 Critical Corridors

Location	Issues	Ongoing - Interim Needs	Next Step	Priority
<p>SIXTH ST FROM GLENWOOD TO INDIAN BROOK DRIVE</p> <p><i>"UPPER SIXTH ST"</i></p>	<ul style="list-style-type: none"> ▪ Modified design per new City standard for traffic calming completed 	<ul style="list-style-type: none"> ▪ Completed with federal fund assistance in 1999 	<p>No further improvements necessary</p>	<p><i>N/A</i></p>
<p>SIXTH ST FROM GLENWOOD TO CENTRAL AVE</p> <p><i>"LOWER SIXTH ST"</i></p>	<ul style="list-style-type: none"> ▪ Full reconstruction underway ▪ Provide safe pedestrian/bike access and implement speed management design in this neighborhood corridor 	<ul style="list-style-type: none"> ▪ Utility work begun 1998 & 1999 ▪ Full reconstruction to be completed as City project in 2000 & 2001 ▪ Implement neighborhood sensitive design and implement speed management 	<p>No further improvements will be necessary</p>	<p><i>N/A When completed</i></p>
<p>CENTRAL AVE FROM WATSON ST TO DURHAM RD</p> <p><i>"SOUTH CENTRAL"</i></p>	<ul style="list-style-type: none"> ▪ Maximize safe travel speeds and flow ▪ Eliminate congestion & backups at signalized intersections 	<ul style="list-style-type: none"> ▪ Consider signalization of Back River Rd ▪ Coordinate Central Avenue signals ▪ Access and proper lane issues ▪ Effect of New School traffic and turning movements 	<p>Develop Central Ave policy for improvements – Fund and implement Central Avenue Corridor Study; school & new developers participation</p>	<p><i>High</i></p>
<p>NH 108 FROM BACK RIVER RD TO MADBURY TL</p>	<ul style="list-style-type: none"> ▪ Insufficient shoulders for bicycle use 	<ul style="list-style-type: none"> ▪ Scheduled for construction of shoulders for safer bicycle use in 2000-2001 ▪ New school has created additional turning movements ▪ Monitor for needs per any adjacent rezoning 	<p>Assess need for turn lanes associated with new middle school</p>	<p><i>N/A after 2000</i></p>

Intersections

In the past, the City has retained various consultants to provide technical input and assistance with intersection studies. The 1988 Master Plan featured numerous technical analyses of intersections with recommended improvements. Since that time, many of Dover's problematic intersections that had practical upgrades identified have been upgraded. This section explains how intersections can be evaluated in a practical sense and provides data and a prioritized list for improvements.

Intersection LOS	Conditions	Average Delay Per Vehicle
A	Free flow	< 5.0 seconds
B	Slight congestion	5.1 to 15.0 seconds
C	Average congestion	15.1 to 25.0 seconds
D	Above average congestion	25.1 to 40.0 seconds
E	High congestion	40.1 to 60.0 seconds
F	Extreme congestion	> 60.1 seconds

Source: Highway Capacity Manual, 1994

An intersection's Level Of Service (LOS), or the level to which it is processing vehicles, effectively is determined by counting all turning movements within an intersection over a specific time period and calculating a rating based on this collected data. A turning movement count is used to perform an LOS analysis. Turning movements are all legal turns a vehicle can execute within an

intersection. As with roadway segments, intersection LOS has 6 stages, ranging from "A" to "F".

LOS "C" is normally utilized for design purposes and describes stable traffic flow conditions. In an urban setting it is the norm. This intersection, with a LOS C is somewhat congested due to high traffic volumes, but flow conditions are acceptable to motorists. LOS ratings are very good indicators of what motorists may experience at an intersection, but it has shortcomings. The first shortcoming is that LOS only portrays what a motorist may experience and has no relationship to what a pedestrian or bicyclist encounters. The secondary shortcoming of LOS is that it is based on research from suburban locations. For urban intersections in downtown Dover, such as the Main Street/Central Avenue intersection, a poor LOS rating may not be inherently bad or solvable. The third shortcoming is in the application of an LOS rating. Once determined, LOS is used to ascertain an engineered solution exclusively for vehicle traffic. When applying an LOS rating the intersection's location, possible resolutions, and other modes of transportation must be equally weighed in determining a logical solution.

Methodology and Analysis

Starting with a historical review of the 1988 Master Plan, problem intersections were identified by using a combination of the above LOS calculation process, as well as City Planning Department assistance based on input from various other City departments, observations, and citizen input. Intersections identified in the 1988 Master Plan were screened for work subsequent to recommendations in the 1988 Plan. These intersections are identified in the **Table T-5 – Intersection Deficiencies**, as well as portrayed on **Map T-5 - Intersection Deficiencies**, and were included based on confirmation of existing geometric problems, congestion, accident history, and potential future insufficient capacity.

The table includes any previous corrections or improvements, current status and future practical corrections or improvements.



Many of Dover's problem intersections are constrained due to surrounding buildings, narrow right-of-ways or geographic features. The City should accept that many of its CBD intersections would have low traditional LOS ratings. In some cases, these intersections are actually beneficial to the surrounding streets by limiting traffic speeds or discouraging thru-traffic use.

Table T-5 - Intersection Deficiencies

Intersection Location	Deficiencies & Level of Service AMV = Accidents per million vehicles	Previous Corrections or Improvements	Current Status	Future Practical Corrections or Improvements	Prioritization for Upgrade
CHESTNUT ST AT SIXTH ST	<ul style="list-style-type: none"> • LOS = C-D • 4 way unsignalized 	<ul style="list-style-type: none"> ▪ Review warrants and consider with adjacent intersections 		Review after completion of Dover Intermodal Transportation Center	High Upper Central Ave Study
CENTRAL AVE AT SIXTH ST	<ul style="list-style-type: none"> • LOS = B-C • AVM = 0.5 	<ul style="list-style-type: none"> ▪ Left turns difficult. ▪ Review warrants and consider with adjacent intersections 	Improvements may require ROW acquisition and should be done as part of a comprehensive design of adjacent intersections	Consider comprehensive redesign to combine intersections and create multi-purpose space	High Upper Central Ave Study
CENTRAL AVE AT CHESTNUT ST	<ul style="list-style-type: none"> • LOS = F 	<ul style="list-style-type: none"> ▪ None ▪ Backs up to Sixth and Chestnut ▪ Basic signalization would not correct problems 	Improvements may require ROW acquisition and should be done as part of a comprehensive design of adjacent intersections	Consider comprehensive redesign to combine intersections and create multi-purpose space	High Upper Central Ave Study
CENTRAL AVE AT WASHINGTON AND HENRY LAW AVE	<ul style="list-style-type: none"> ▪ Central Ave backups ▪ LOS = D 	<ul style="list-style-type: none"> ▪ None 	Deficient and unsafe access to/from Henry Law Avenue. Major Central Ave backups for through traffic	New controller and light set with full actuated on all approaches.	High Upper Central Ave Study
COUNTY FARM RD AT WATSON RD	<ul style="list-style-type: none"> • Grade/Sight distance • Crest of vertical curve • LOS = A • AMV = 0.6 	<ul style="list-style-type: none"> ▪ Realign intersection into standard format and geometry – partial work completed in 1997 	Improved but still substandard	Limited due to site. Current development on Watson Road may necessitate further improvements	Medium
CENTRAL AVE AT LOCUST ST.	<ul style="list-style-type: none"> ▪ Substandard geometry ▪ LOS = F ▪ AMV = 0.5 	<ul style="list-style-type: none"> ▪ Signalization ▪ Channelization 	Completed per 1988 Master Plan. Further improvements through hard-wire signal integration	Corridor Study Signal Interconnect and minor lane restripe	Medium Lower Central Ave Study

Table T-5 - Intersection Deficiencies

Intersection Location	Deficiencies & Level of Service AMV = Accidents per million vehicles	Previous Corrections or Improvements	Current Status	Future Practical Corrections or Improvements	Prioritization for Upgrade
CENTRAL AVE AT OAK ST/RESERVOIR RD	<ul style="list-style-type: none"> • LOS = E • AVM = 0.9 	<ul style="list-style-type: none"> ▪ Signalized ▪ Oak St realigned ▪ Channelization and Signage 	Work Completed in 1997	Signal interconnect and corridor lane restriping	Medium Upper Central Ave Study
CENTRAL AVE AT OLD ROLLINSFORD RD	<ul style="list-style-type: none"> • LOS = D 	<ul style="list-style-type: none"> ▪ Signalized in 1980s – Median improved for right turns 	OK	Optimize signal phases – possible tie in with Miracle Mile signals	Medium Upper Central Ave Study
PORTLAND AVE AT CHAPEL ST	<ul style="list-style-type: none"> ▪ Grade and sight distance ▪ Substandard geometry ▪ LOS = F at peak ▪ AMV = 0.2 	<ul style="list-style-type: none"> ▪ Signage – warning upgrade ▪ Northbound left-turn restriction but impractical 	Site limitations prevent simple solution	Maintain sight distance and improve warning signs on all approaches	Medium
NH 108 AT LONG HILL RD	<ul style="list-style-type: none"> • Unsignalized • LOS = D-E 	<ul style="list-style-type: none"> • City added left turn lane on Long Hill Rd – lanes restriped 	Scheduled for rehabilitation and double signalization 2005	Monitor NH 108/Exit 10 Access Management should be strictly enforced in re-development of Corridor – review warrants	Medium
NH 9 AT COLUMBUS AVE	<ul style="list-style-type: none"> • LOS C-E (1998) 	<ul style="list-style-type: none"> • Intersection realigned and sight distance improved in 1997 	City should monitor development on Columbus Ave and recommend impact fee funding of match for signalization	Signalization on long-term (not funded) MPO project development list to include NH 9 center turn lane	Medium
WEEKS CROSSING	<ul style="list-style-type: none"> • LOS B-D? 	<ul style="list-style-type: none"> ▪ Circle removed and reconfigured into multiple signalized intersections in 1990s 	OK	Optimize and tie in signal timing as part of Upper Central Study	Medium Upper Central Ave Study

Table T-5 - Intersection Deficiencies

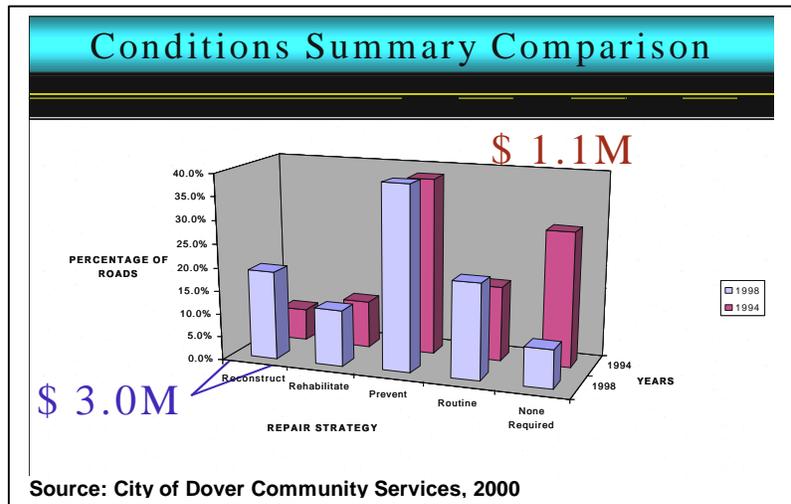
Intersection Location	Deficiencies & Level of Service <i>AMV = Accidents per million vehicles</i>	Previous Corrections or Improvements	Current Status	Future Practical Corrections or Improvements	Prioritization for Upgrade
SILVER ST AT NH16 NORTH ON-RAMP AND BEGIN OF NH155	<ul style="list-style-type: none"> • LOS = N/A • AMV = N/A 	<ul style="list-style-type: none"> ▪ None 	Numerous turning movement conflicts and driveway cuts that need to be reexamined.	Interim: Stripe (construct width if necessary) a left turning lane for eastbound traffic to move turning vehicles out of the flow of traffic. Long-term: Investigate the potential for realigning NH155/Silver Street further north (away from driveways) to form signalized intersection beyond driveway cuts for McIntosh College and filling stations.	<p align="center">Medium</p>
COUNTY FARM RD AT SIXTH ST	<ul style="list-style-type: none"> • Grade/Sight distance • LOS = A • AMV = N/A 	<ul style="list-style-type: none"> • Upgraded as part of Sixth St reconstruction. • Conduit for future signal installed 	<p align="center">OK</p>	Potential signalization with expansion of Enterprise Park or surrounding development. City should assess contribution fees	<p align="center">Low</p>
CENTRAL AVE AT COURT/HANSON ST	<ul style="list-style-type: none"> • LOS = C-D • AMV = N/A 	<ul style="list-style-type: none"> ▪ All practical improvements completed at time of Silver/Central reconstruction 	<p align="center">Completed</p>	<p align="center">NA</p>	<p align="center">Low Upper Central Ave Study</p>
CENTRAL AVE AT SHOP-N- SAVE	<ul style="list-style-type: none"> ▪ Signal timing ▪ Signal coordination with neighboring intersections ▪ LOS = B ▪ AMV = 0.1 	<ul style="list-style-type: none"> ▪ Corrected and coordinate signal timing (1996) to adjacent signals on immediate Central Ave 	<p align="center">Functional</p>	Pending CMAQ proposal to hard wire Central Ave signal coordination to Weeks Crossing signal set	<p align="center">Low</p>
NH 155 AT WESTGATE APTS (SOUTH ENTRANCE)	<ul style="list-style-type: none"> ▪ Sight distance ▪ Crest of vertical curve ▪ LOS = D ▪ AMV = 0.4 	<ul style="list-style-type: none"> ▪ Flashing beacon (currently non-permitted solution) 	Work Completed – vertical curve corrected	None scheduled - COMPLETED	<p align="center">N/A</p>

Table T-5 - Intersection Deficiencies

Intersection Location	Deficiencies & Level of Service AMV = Accidents per million vehicles	Previous Corrections or Improvements	Current Status	Future Practical Corrections or Improvements	Prioritization for Upgrade
STARK AVE (NH 108) AT CENTRAL AVE	<ul style="list-style-type: none"> ▪ Substandard geometry ▪ LOS = >D ▪ AMV = 1.1 	<ul style="list-style-type: none"> ▪ Signalize ▪ Channelize ▪ Minor widening 	<i>All practical improvements completed</i>	None scheduled - COMPLETED	N/A
NH 108 AT BACK RIVER RD	<ul style="list-style-type: none"> ▪ Substandard geometry, queuing from neighboring intersection ▪ LOS = E-F ▪ AVM = 1.0 	<ul style="list-style-type: none"> ▪ Signalization, channelization and tie-in with Spaulding ramp signalization 	Site is scheduled for signalization in 2000 under the CMAQ program	None necessary	N/A
SILVER ST AT TOWLE AVE AND ARCH ST	<ul style="list-style-type: none"> ▪ Sight distance ▪ Crest of vertical curve ▪ Vegetation ▪ LOS = F ▪ AVM = 0.4 	<ul style="list-style-type: none"> ▪ Signalized ▪ Channelized ▪ Improved turning radii ▪ Informational signage 	Completed	None necessary	N/A
PORTLAND AVE AT OAK ST	<ul style="list-style-type: none"> • LOS = < D • AMV = N/A since upgrade 	<ul style="list-style-type: none"> ▪ Signalize ▪ Channelize ▪ Add left turning lanes on Oak St 	Work Completed in 1999	Monitor interaction with Oak and Broadway	N/A
BROADWAY AND OAK ST	<ul style="list-style-type: none"> ▪ Sight distance ▪ Crest of vertical curve ▪ LOS = F ▪ AMV = 2.6 <p><i>Most dangerous intersection in Dover</i></p>	<ul style="list-style-type: none"> ▪ Two-way STOP control installed after 1988 Plan 	Project funded for signalization and sidewalk improvements	Work to be completed in 2001 with federal fund assistance	N/A after 2001 work
CHESTNUT ST AT GREEN ST	<ul style="list-style-type: none"> • LOS = F • AVM = 0.5 	<ul style="list-style-type: none"> ▪ Green Street closed to local traffic 	Improvements suggested in 1988 Plan were completed	NA	NA

Road Surface Conditions

In most municipalities throughout the United States, road and street surfaces represent the largest single infrastructure asset. Because of this tremendous investment in roadway systems, local communities must control costs by slowing pavement deterioration. This requires making cost effective decisions regarding the maintenance, repair, rehabilitation, and reconstruction of their municipal road network. Developing a maintenance budget based on cost-effective decisions requires a rational systematic process. City officials must be able to evaluate the condition of the road network and allocate funds where they can do the most good and away from political influence or pressure.



To assist in this process, Dover officials have traditionally used Road Surface Management System (RSMS) software. This enables a quantitative assessment of the condition of the road network. This data can provide a basis by which City officials can weigh alternatives, establish a long-term maintenance schedule, and reach their annual budget goals.

The RSMS Process

The main function of RSMS is to store road inventory information, to analyze road data, and to generate maintenance reports that assist municipal officials in making cost-effective decisions.

The RSMS process includes the following tasks at the network level:

- Taking an accurate inventory of the network
- Assessing the condition of the network
- Developing maintenance and rehabilitation alternatives
- Weighing the alternatives
- Prioritizing maintenance needs
- Generating reports that support budgets and findings

The first two tasks require developing a database of information pertaining to the physical features of the road network and the present condition of the pavement surfaces. The rest of the process is the careful development of maintenance strategies that are right for the local situation.

Existing Road Surface Conditions

As road surfaces age, the rate of deterioration accelerates and repair strategies become dramatically more expensive. This trend can be seen above in the "Conditions Summary Comparison" for the City's roads using 1994 and 1998 inventory data. As problem areas are neglected over time, the needs become more severe. This trend can be seen in the graph, as more roads slide from the "Routine" maintenance side of the graph at the right, to the major "Reconstruct" bars represented on the left of the graph. This resultant increase in the cost to maintain the same network of roads is highlighted by the increase in major reconstructions needs from \$1.1 to \$3 million over the span of this analysis. This highlights the need to address these situations as they arise rather than waiting and paying the price as road conditions degrade.

While the RSMS technique employed by the City provides a basis for which to begin prioritizing and planning a schedule for road surface maintenance, it should serve only as a starting point. The data that is input into the software does not account for other issues, such as known land use and development patterns and projects, traffic patterns, and other subjective information that might enter into the decision making process. City officials should continue to apply judgement to the process in order to expend efforts and funds in the best interest of the City's long-term objectives.

Table T-6 – Major Reconstruction Needs

Description
Silver Street from NH16 onramp to Central Ave
Locust Street from Silver Street to Central Ave
Henry Law Ave from Washington Street to Paul Street
Portland Street from Main Street to Chapel Street
Broadway Street from Central Street to construction limit of Oak Street/Broadway intersection
Oak Street from Portland Ave to Central Ave
NH16B from Indian Brook Drive to City Line
Arch Street from Fourth Street to Central Ave
Horne Street from Sixth Street to Roosevelt Ave
Central Ave from Ham Street to Sixth Street
Glenwood Avenue

Using recent information from Dover's RSMS system, field surveys by SRPC staff, and knowledge and judgement of the City Planning Department, major reconstruction needs were identified. By implementing these improvements as soon as possible, the City will be able to significantly reduce the overall costs in the future. **Table T-6 Major Reconstruction Needs** and **Map T-6 - Major Reconstruction Needs** portray some of the most pressing repair needs.

Access Management

As described in the recently completed Route 16 Corridor Study, Access Management is a tool to ensure the safe and efficient movement of vehicles by striking a balance between property access, in the form of curb cuts, and *mobility*. All roads serve these two basic functions. They provide a means by which to access parcels of land and the homes, businesses, or other features, and they also serve as a means of mobility to get from one place to another. These two functions can come into direct conflict with each other if they are not both considered when making decisions about land use and transportation.

The road system can be generalized as having four broad categories. These are Interstate Highways, Arterials, Collectors, and Local Streets. Arterials and Collectors require the highest degree of Access Management. These types of roadways generally have high traffic volumes, which make them very attractive to businesses that want lots of visibility and potential customers. As more curb cuts or points of access are made into adjacent lots, the capacity of the road to carry traffic through the area decreases. This ends up creating a congested "strip" that becomes unattractive even to shoppers, eventually negatively affecting those businesses that located there originally. Now the roadway serves neither of the purposes originally described above. Collectors and local streets are not as subject to these issues but still need to be watched carefully.

Commercial Traffic

Truck traffic in the City has long been an issue of concern for residents, City officials, and trucking industry representatives. Discussion among these various groups has occurred as specific issues have arisen. This topic becomes even more complex with the need to coordinate with the surrounding communities and their needs regarding commercial traffic. As a result of these issues, Dover has formulated specific truck routes and closed certain roads to truck usage.

As a general policy, the City has identified numbered and state-maintained routes, e.g., NH Route 9, NH Route 155, and NH Route 16, as the appropriate routes for commercial trucks. Trucks making local deliveries or originating at locations on local roads are allowed to travel local roads. The City has adopted this policy for numerous reasons. State routes are generally built to a standard that is able to handle higher gross weights and therefore will withstand commercial traffic with less damage. Local roads maintained by the City are generally not able to withstand repeated use by heavy commercial vehicles. This can mean increased infrastructure and maintenance costs for the City if local roads are used regularly as truck routes. Concern for safety and increased noise levels in residential neighborhoods are also a factor in decisions about the appropriateness of designating a road as open or closed to commercial traffic.

It should be stressed the City's objective is not simply to limit the options for commercial traffic. The City is sensitive to the concerns of commercial establishments that require heavy trucks as a part of their livelihood. The City believes that this type of commerce is a positive component of the local and regional economy and simply wishes to balance the needs of these businesses with other issues, such as promoting safety, controlling any unnecessary noise, and the need to minimize infrastructure costs.



In 1996, the City held a series of meetings and formed a special committee between City officials and trucking firms. The City amended the listing of roads subject to commercial truck traffic restrictions. Subsequent modifications have been made since these meetings as particular issues have arisen. The following tables outline the current commercial/heavy truck restrictions and accepted commercial traffic routes for the City of Dover. The general feeling is that the current listing of commercial traffic restrictions serves the respective parties relatively well. However, this list is regularly revisited by the City to determine if it still meets the needs of the community. New roads may be added or old ones deleted as necessary. The following **Table T-7 Commercial Traffic Restrictions** presents road restrictions at the time of printing of this chapter.

Designation of Commercial Routes

The process of designating a road as partially or totally closed to commercial traffic begins in the community. Once a concern is voiced to the Parking and Traffic Safety Committee it will be studied by the Planning Department and addressed by the Planning Board. Their recommendation will go to the City Council. The City Council will ultimately decide what action to take.

Table T-7 - Commercial Traffic Restrictions

ROADS ON WHICH THROUGH COMMERCIAL VEHICLE TRAFFIC IS PROHIBITED
Old Rochester Road
Washington Street
Arch Street
Lexington Street
Cushing Street
Belknap Street
Atkinson Street
Green Street
George Street
Bellamy Street
Back River Road
Piscataqua Road
Spring Street
Summer Street
Trakey Street
Birchwood Place

ROADS ON WHICH TRACTOR TRAILER COMBINATIONS ARE PROHIBITED
Watson Road
Glen Hill Road
Columbus Ave
Whittier Street

ROADS ON WHICH THROUGH COMMERCIAL VEHICLE TRAFFIC SHALL BE ALLOWED
Spaulding Turnpike (NH16)
Central Avenue
Dover Point Road
NH108 to Madbury
NH155 to Durham
NH9 to Madbury
Silver Street
New Rochester Road
Longhill Road between New and Old Rochester Rd.
Sixth Street Connector (Indian Brook Drive)
Sixth Street from the Connector to Production Drive
Main Street
Portland Ave
Chapel Street
St John Street
Oak Street
Gulf Road

Dover Code - Vehicles and Traffic

166-53. SCHEDULE F: Commercial Vehicle Truck Travel Restricted. [Amended 05-15-91 by Ord. No. 18-91, Amended 11-11-98 by Ord. No. 17-17]

In accordance with the provisions of **166-5C**, the following streets shall be restricted to pleasure vehicles and commercial vehicles making a delivery or pickup. Through commercial vehicle traffic shall be prohibited. "Commercial Vehicles" shall be defined as those over 26,000 pounds gross weight unless otherwise noted to a particular classification on a particular street. [Amended 01-29-97 by Ord. No. 01-97]

Note: refer to Table T-7 Commercial Traffic Restrictions for a full listing of roads affected by this ordinance

Source: DoverNet - City of Dover Website



Recommendations - Roads

- *Create a coordinated plan for the management and improvement of Central Avenue, from the Wentworth-Douglas Hospital to the intersection with Chestnut Street. This does not necessarily include widening the road, as has been suggested in the past.*
- *Chestnut Street, from Central to Washington Street, needs a similar comprehensive plan that looks at the new Intermodal Transit Station and the redevelopment of the area around Green Street. The coming of passenger rail service and the effects of the activity around the rail platform will have a significant impact on this corridor and warrants further study.*

- *Abandon the strategy of widening Central Avenue, which was suggested in the 1988 Master Plan.* The City should use more creative and less damaging strategies such as striping, planted median and parking designs to increase traffic flow and the livability of the downtown core. Traffic capacity expansion should not be the driving force behind transportation policy in Dover.
- *Implement Access Management techniques at the Silver Street intersection with Spaulding Turnpike North, and various businesses in this vicinity.* This area is particularly chaotic with driveway cuts and intersections.
- *The City should study ways to safely and efficiently funnel traffic to and from the downtown area and the Turnpike that would relieve pressure on existing roads. The City should also work toward any eventual construction using grants from Federal Highways and the state.* This technique will help ensure acceptable function of several existing corridors into the downtown.
- *Work toward the elimination of tolls between Portsmouth and Dover.* This has the potential to diminish whatever level of diversion traffic passes unnecessarily through the downtown area.

Recommendations - Road Surface

- *Continue to utilize the advantages of RSMS as a starting point for prioritizing roadway surface improvements.* This will aid in the development and continuation of present and future capital improvement plans. RSMS can serve to lessen the cost and need for road rehabilitation and reconstruction projects by prioritizing current needs and scheduling work before the road surfaces become extremely degraded. It is imperative to the success of this technique that data be recent and accurate. This means regular updating of the input data and running of the software. The City should continue to enter staff knowledge into the process and use the RSMS process as a basis for prioritization of projects.
- *Continue funding routine and preventative road maintenance programs.* Routine and preventative maintenance program will protect the roads that are in good condition from degrading. This will extend the life of road surfaces and save the City money in the long -term. This funding is key to keep ahead of the curve in maintenance of the City's road system.
- *Continue to integrate large projects into the Capital Improvement Program.* The Capital Improvement Program clearly schedules and coordinates projects, so that the funds for each project are effectively spent.

Recommendations - Intersections

- *Determine a LOS quality standard for intersections within the CBD.* Dover should adopt a LOS "E" and average vehicle delay of not more than 59.0 seconds as the maximum permissible amount of congestion to occur at intersections within the CBD. The present LOS for many intersections within the CBD meets this standard.
- *Monitor LOS at intersections within the CBD.* At some intersections in the CBD, congestion may not be easily solvable and it may not be appropriate to do so. Dover should permit some amount of congestion to occur at intersections in the CBD as this will slow vehicle speeds, tend to dissuade pass-through trips, and encourage people to park, walk, and visit destinations within the CBD.
- *Use intelligent transportation systems to reduce or mitigate congestion.* Currently signal timing and traffic flow technology is very sophisticated and can quite easily redirect traffic around major accidents or away from a congested intersection. Dover should consider using intelligent transportation systems to control the flow of traffic around the CBD.

- *Many intersections with low LOS ratings are simply permanently constrained and the City needs to adapt to that constraint.* They should be removed from discussion for expansion and instead, the City should be looking at technology improvements and access management approaches.

Recommendations - Access Management

- *Identify key corridors that are especially susceptible to this type of development pattern due to road and zoning characteristics.* This will allow the City to clearly define and prioritize its efforts in preventing this type of development and improve, to whatever degree possible, sections of roads that have already seen this pattern of development.
- *Identify and define the character and use of its roadway corridors from this perspective.* Using proper driveway placement, well thought land use and transportation decisions backed by site plan review, subdivision regulations, and city ordinances including consideration of these issues, will allow the City to create and/or preserve the character of important roadway segments.
- *Use the Access Management resources available through the SRPC and the NHDOT.* Much of this is the product of the NH16 Corridor Protection Study and provides guidance on how to formulate regulations and site review processes to achieve the desired end of balancing the dual purpose of roadways.
- *Obtain copies of Access Management Overlay District plans from other cities and towns to determine whether this technique is appropriate for the City's needs.* This technique may be fitting for some road segments.
- *Review site plan and subdivision regulations to ensure they actively promote Access Management techniques.* These are the tools that will allow the City to effectively see to the implementation of these techniques. The City should have clear power to control existing and future access points through ordinances adopted, as appropriate, to achieve this end.

Recommendations - Commercial Traffic

- *Regularly evaluate truck routes within the Central Business District (CBD).* Within the CBD, large trucks passing through without any destination in Dover are a problem along several streets. These trucks should be dissuaded from using municipal roads and encouraged to use NH Route 16. One corridor especially difficult to deal with will be NH Route 4 from South Berwick and Rollinsford, which has very few bypass alternatives around the CBD. Oak Street and Central Avenue leading to and from NH Route 16 exit 9 is a logical route with several projects planned over the next 20 years that would facilitate these roads as a truck route.
- *Enforce special truck weight restrictions in the springtime when roadbeds are particularly saturated from spring thaw and runoff.* Much damage can occur during this time of the year since roadbeds are wet and not able to support as much weight as normal.
- *Business, planning, and or community representatives should continue to speak up regarding these issues.* Issues should be brought to the attention of the Parking and Traffic Safety Committee that can, in turn, make recommendations to the City Council.

Bridges

The City has a broad array of bridges ranging from a covered pedestrian bridge over the Cochecho River to those spanning the Spaulding Turnpike. In general, the entire bridge inventory in Dover is in very good condition. Some are the City's responsibility and some are the responsibility of the State. NHDOT evaluates and maintains a detailed database of all bridges over 20 feet long. The evaluation and database include structural adequacy, construction method, functional obsolescence, AADT, and age. From this information and other data NHDOT develops a sufficiency rating.



Bridges rated as functionally obsolete or structurally deficient, and/or with a sufficiency rating of less than 50 out of 100 need replacement or reconstruction. Dover is presently in good standing with regards to bridge condition, with only one active bridge well under acceptable sufficiency. This bridge, NH9 over the B&M railroad, is scheduled for reconstruction in 2000-2001. **Table T-8 Bridges and Map T-7 Bridges** contains detailed information on this bridge as well as other bridges of significance in Dover's road network that are not problematic from the standpoint of condition or function .

Recommendations

- *Aggressively proceed with the reconstruction of the Washington Street Bridge using local funds.* This bridge is vital to the Riverfront redevelopment effort. At the time this reconstruction is designed, the City should complete a thorough review of the downtown traffic pattern system. It is likely that completion of the Washington Street Bridge will necessitate signalization at Main Street and advance the opportunity for two-way traffic in downtown.
- *Apply for Municipal Bridge Program funds through NHDOT* – This is a very valuable, but under-utilized program. It provides 70% of the full costs to rebuild or repair a City -owned bridge.
- *Reuse of Bridge #057/017* – Bridge #057/017 currently sits on the side of Watson Road where it was moved to when replaced by a new structure. It is an historic type of bridge and could be moved for use in a bridge replacement project on a low traffic volume road or could be used along one of several proposed bikeways throughout Dover.
- *Ensure that all bridges over the Spaulding Turnpike maintain adequate sidewalks during the current round of reconstruction.* This is an important link in the transportation network for not only automobiles but pedestrians and bicyclists alike as it is on the MPO and State bicycle route networks.
- *Encourage NHDOT to rehabilitate the General Sullivan Bridge (Bridge #200/023)* is an historic type of bridge that is perfectly situated to provide a bicycle and pedestrian link from Dover to Newington.
- *Continue to plan in the long-term to rebuild the Cochecho River Bridge on County Farm Road and reconnect this road to the regional system.* Reconstruction of this bridge should be coordinated with the reconstruction of County Farm Road.

Table T-8 Bridges

Bridge Location	Federal Sufficiency Rating, Deficiency, etc.	Current Status	Future Practical Corrections or Improvements	Prioritization for Upgrade
CUSHING RD OVER NH 16 BRIDGE #160/083 –	<ul style="list-style-type: none"> ▪ FSR = 75 ▪ Structurally deficient ▪ 500 ADT ▪ Constructed 1956 ▪ State owned 	Scheduled for rehabilitation in 2001	Maintain sidewalks in reconstruction	Low
SIXTH ST OVER NH 16 BRIDGE #105/138 –	<ul style="list-style-type: none"> ▪ FSR = 61.8 ▪ Functionally Obsolete ▪ ADT ▪ Constructed 1957 ▪ State owned 	Scheduled for rehabilitation in 2001	Maintain sidewalks in reconstruction	Low
NH 9 OVER NH 16 BRIDGE #121/106 –	<ul style="list-style-type: none"> ▪ FSR = 68.2 ▪ ADT ▪ Constructed 1957/1973 ▪ State owned 	Scheduled for rehabilitation in 2000-2001	Maintain sidewalks in reconstruction	Low
NH 9 OVER B&M RAILROAD BRIDGE #109/106 –	<ul style="list-style-type: none"> ▪ FSR 31.5 ▪ Structurally deficient ▪ 10,200 ADT ▪ Constructed 1935 ▪ State owned 	Scheduled for reconstruction using state and federal funds starting in 2000.	Full double stack clearance bridge replacement and width increase for center turn lane on NH 9	Medium
GENERAL SULLIVAN BRIDGE OVER LITTLE BAY (PREVIOUS US ROUTE 4) BRIDGE #200/023	<ul style="list-style-type: none"> ▪ FSR 29.0 ▪ Structurally deficient ▪ ADT ▪ Constructed 1934 ▪ State owned 	This bridge is currently open only to pedestrian and bike use. Emergency use discontinued in 1999	Removal or reuse plan to be developed in Newington-Dover Spaulding improvement project that is underway. City should participate in process	Medium

Table T-8 Bridges

Bridge Location	Federal Sufficiency Rating, Deficiency, etc.	Current Status	Future Practical Corrections or Improvements	Prioritization for Upgrade
WATSON RD BRIDGE 057/17 – CLOSED LATTICE TRUSS	<ul style="list-style-type: none"> ▪ Historic metal truss bridge ▪ Municipally owned 	This bridge is not in service. It remains resting on the side of the Cocheco River banks Closed and removed from site	Remove or use elsewhere	NA
CENTRAL AVE OVER COCHECO RIVER BRIDGE 131/123	<ul style="list-style-type: none"> • Not Deficient • Sufficiency 94/100 	Referred to as NH 9, NH 108 SB over Cocheco in state records. Primary Compact Maintenance Owner is municipality	OK	NA
WATSON RD OVER COCHECO RIVER BRIDGE 079/140	<ul style="list-style-type: none"> • Not Deficient • Sufficiency 89/100 	Primary Compact Maintenance Owner is municipality	OK	NA
NH 108 OVER BELLAMY RIVER BRIDGE 130/099	<ul style="list-style-type: none"> • Not Deficient • Sufficiency 87/100 	Primary Compact Maintenance Owner is municipality	OK	NA
WASHINGTON ST OVER COCHECO RIVER (NH 9, NH 108 NB) BRIDGE #/134/122 –	<ul style="list-style-type: none"> ▪ FSR 91,1 ▪ Structurally sufficient ▪ 26,000+ ADT ▪ Constructed 1977 ▪ Municipally owned 	Vast pavement width and limited channelization promotes high speeds in this corridor. City should consider major surface changes to bridge to control vehicle speeds. This may include adding parking, channelization, deceleration lane for future garage and widening sidewalks as well as adding lighted and marked crosswalks	Medium	
BELLAMY RD OVER BELLAMY RIVER BRIDGE #120/098	<ul style="list-style-type: none"> ▪ FSR 51.7 ▪ 4,200 ADT ▪ Constructed 1967 ▪ Municipally owned 	Open and in use	Monitor	Low

Accidents

The safe travel of the public and the movement of goods is the primary objective of the road network. A high accident location is a symptom that may indicate potential intersection or road network deficiencies such as poor sight distance, excessive traffic speed, high levels of traffic with conflicting movements, substandard alignment or overall congestion. The City of Dover Police Department and the NH State Police keep records and occasionally review the history of accidents throughout the City. The City annually provides the State with a listing of all reported traffic accidents by location, number of vehicles involved, number of fatalities and other relevant data.

Methodology and Analysis

For this analysis, point data of accident locations for Dover was accessed through the NHDOT and their accident-reporting database. While this data presents some limitations regarding particular accident information, it works as a good tool when presented graphically. General areas of high accident activity appear quite clearly when mapped.

The total annual number of accidents at a particular site or intersection can be used as an indicator for establishing more restrictive traffic controls. The Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices considers an accident frequency of 5 or more per year a basis for further examining warrants for reduction to speed limits, warning signs, or intersection signalization. Should the City wish to study any of the general areas identified as high accident corridors or intersections, these methodologies should be followed in order to determine the approach to take in remedying the deficiency.

Table T-9 – High Accident Corridors

NH 108-Upper Central Avenue
NH 108-Middle Central Avenue
Silver Street
Broadway
NH 108-Central Avenue/Durham Road

Source: Visual interpretation of scatter plot Map T-8

Table T-9 High Accident Corridors summarizes some of the more problematic areas of the City with regards to high accident frequencies. **Map T-8 - Accidents** summarizes accident locations for 1997, 1998, and 1999 as reported by NHDOT's accident report database.

Recommendations

- *Review the accident data presented in this document* Clusters of accident locations should be compared with prioritized improvements. Any unusual accident locations should be investigated.
- *Investigate traffic-calming techniques and apply them where appropriate.* A lengthy description of these techniques appears in the "Pedestrian" section of this chapter. These techniques serve safety purposes from the perspective of vehicular traffic and pedestrians.

Note – this data source may not accurately represent pedestrian-vehicle accidents. When evaluating these data for crosswalk improvements, City staff should rely on local police knowledge.

Work-Commute Patterns

Tables T-10a and T-10b show the 1990 work commuting patterns of Dover residents. This data can help determine where people are going and coming from for their daily commute. This can be used to provide information on possible policies about road improvements. Some items from the 1990 Census to note regarding the City's commuting behaviors: 621 residents walked to work, 331 residents work at home, and 1,931 carpooled while 10,490 drove alone. The majority of commuters leaving the City to work were traveling between 5 and 25 minutes to work. Almost 2,000 Dover residents were commuting to Portsmouth and many others are commuting to Newington, Durham, and Somersworth. With an increase in population most commuting pattern trends have likely become more exaggerated over the span of the past 10 years.

This data portrays our tendency to work and live in different locations. Many of us dream of working at a high paying job in the City and living in a home in a rural suburb. Realizing this dream has led to alarmingly high levels of traffic congestion around metropolitan areas. Despite the fact that Dover is a fair

Commuting Trends

Despite the fact that Dover is a fair sized city with many work opportunities, residents still largely choose to commute to out of town locations to work. Dover also employs a large amount of residents of other towns commuting into the city to work. This trend may point to a mismatch between the residents of the city and the types of jobs offered by employers within the city.

sized City with many work opportunities, residents still largely choose to commute to out of town locations to work. Dover also employs a large amount of residents of other towns commuting into the City to work. This trend may point to a mismatch between the residents of the City and the types of jobs offered by employers within the City. Providing work opportunities that will retain the residents of the City will reduce the demand on the transportation network and build a healthier community that residents and businesses will take more of a personal interest in. The City must continue to consider these economic development concerns as they relate to the transportation network and associated cost of maintenance. Identifying and attracting employers that match well with the citizens of the City will serve to

reduce travel out of Dover and reduce stress on the transportation system.

Of more recent note is the rapid increase in cross-bay commuting. The success of the redevelopment of Pease, job growth on the coast, and the relatively expensive and limited housing options on the coast have created increasing work-home commutes across Great Bay. Many individuals that find employment on the immediate coast are choosing housing options in Dover, Rochester and more rural communities. This creates additional travel demand on the Spaulding Turnpike, Dover Point Road and US 4.

Employment opportunities in Dover are also increasing. 2000 Census data should be incorporated into this Plan when available to allow policy makers an updated view of travel patterns in and around the City. Additionally, the changing transit and commuter options to Boston and Portland may have long-term implications on the travel patterns of Dover residents.

Conclusions and Recommendations

- *Continue to expand and adjust the employment opportunities available in the City to capture as much as possible of the Seacoast growth.* This will require adequate transportation infrastructure investment.
- *City planning staff should review this section when 2000 Census data becomes available.* New data will enable the City to get a clearer picture of current trends and determine marginal change since the last census.

Commuting Into Dover

Source: NH Commuting Patterns, 1994 - based on 1990 Census

Total Working in Town	14,600
Nonresidents Commuting in	9,600
Commuting in Rate	66.1%

From Locations Within NH

Rochester	1,986
Somersworth	1,423
Barrington	584
Portsmouth	440
Exeter	366
Rollinsford	348
Newmarket	228
Milton	222

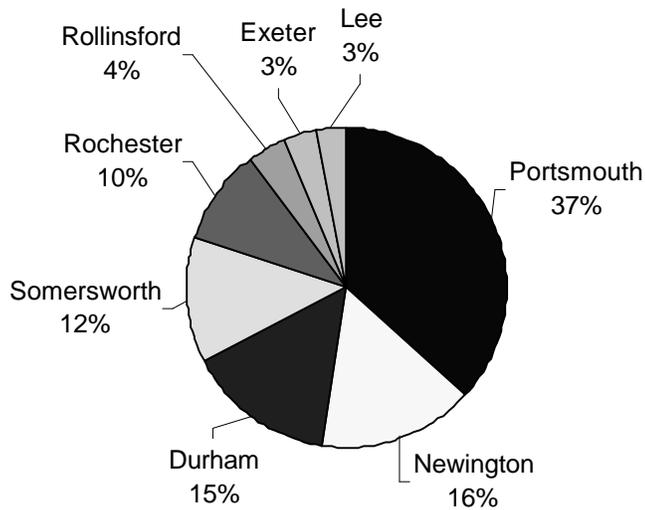
From Specific Out of State Locations

Berwick, ME	400
So. Berwick, ME	300
Lebanon, ME	200
No. Berwick, ME	100

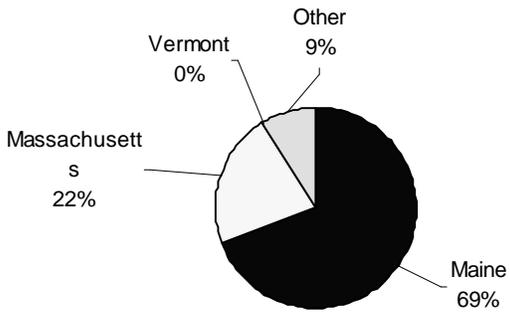
From Other States

Maine	1,600
Massachusetts	1,000
Vermont	500
Other	400

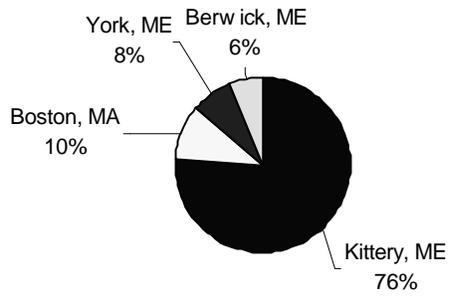
To Locations Within NH



To Other States



To Specific Out of State Locations



Commuting Out of Dover

Source: NH Commuting Patterns, 1994 - based on 1990 Census

Estimated Residents Working	13,755
Commuting to Another Town	8,791
Commuting Rate	63.9%

To Locations Within NH

Portsmouth	1,958
Newington	856
Durham	803
Somersworth	660
Rochester	527
Rollinsford	200
Exeter	186
Lee	158

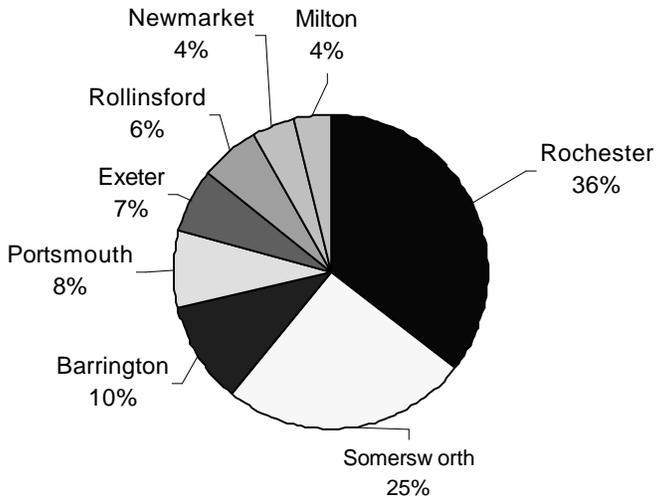
To Specific Out of State Locations

Kittery, ME	931
Boston, MA	120
York, ME	97
Berwick, ME	74

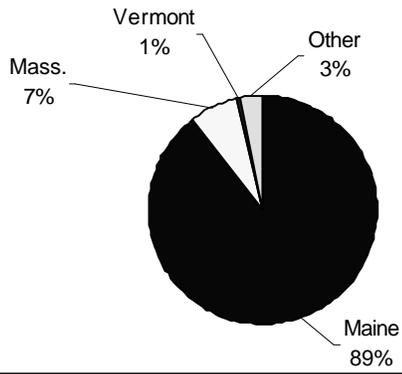
To Other States

Maine	1,362
Massachusetts	426
Vermont	0
Other	172

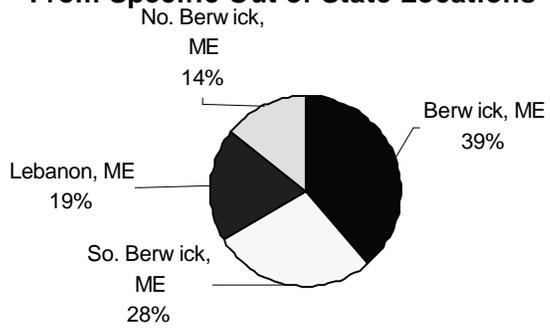
From Locations Within NH



From Other States



From Specific Out of State Locations



Air Facilities and Service

Dover is centrally located between two local public air facilities, both less than 10 miles from the downtown core and three major facilities within 75 miles. The City is increasingly tied to these Intermodal centers for trade, travel, and employment options. The Pease International Tradeport located in Newington-Portsmouth off of the Spaulding Turnpike lies 8 miles to the south and features freight and cargo service through numerous carriers as well as passenger-service that began in 1999 through a private carrier. A new passenger terminal, customs and inspection center was opened in 1999 that can accommodate domestic and international charter and regularly scheduled service. The Tradeport is also home to the NH Air National Guard. The main runway at Pease can accommodate the largest commercial and defense use jets in flight today.

In early 2000, Pease hosted employers providing approximately 3,000 jobs and is projected to be an employment center **for over 12,000 full-time jobs by 2010.**

The State of New Hampshire owns and operates the Skyhaven Airport located approximately 10 miles north of downtown on NH 108 in Rochester. This facility is used by private airplane owners and offers limited commercial services such as charter flights. Also within 10 miles is the privately owned Little Brook Airpark in Eliot, Maine. Both facilities can accommodate small corporate aircraft flight, servicing and storage.

National and international flights are available at Portland International Airport, Manchester Airport and Logan International Airport in Boston. With favorable traffic conditions, the Portland, ME Airport is approximately one hour from Dover, and Logan Airport is approximately one and half -hours away. The Manchester Airport is approximately a one hour and fifteen minute drive from Dover and is becoming a major northern New England regional facility.

Dover also has heliports located at the Wentworth-Douglas hospital on Central Avenue and Liberty Mutual Insurance on Sixth Street.

Recommendations

- *Encourage the complimentary expansion of the Pease International Tradeport and the Skyhaven Airport – Pease International Tradeport and the Skyhaven Airport are employment generators and travel option providers that are key economic feature of the region and Dover.*
- *Improve intermodal access to the Pease International Tradeport and Skyhaven Airport– The City should advocate for the continued improvement of access for commercial and private traffic to these intermodal facilities. This includes:*
 - Support for preservation, and where practical, capacity expansion of direct highway access from NH 16 (Spaulding Turnpike) access should be through as many modes as practical.
 - Support for improved freight rail and intermodal transfer facilities via NH North coast and Guilford Transportation rail systems.
 - Support for continued and expanded transit and charter bus connections between the Tradeport and Dover.
- *Dover should market its air connectivity and support expanded passenger service at these facilities that will offer Dover residents and business convenient passenger and goods transport and improve the attractiveness of the City.*

Rail Facilities and Service

Dover is centrally and prominently located in the regional rail network. Guilford Transportation Inc, owner and operator of the former Boston and Maine Railroad (B & M), maintains tracks through Dover. These tracks consist of the single main line from the Madbury Town line, an additional siding on the south side of town and a recently upgraded four track rail yard from the Broadway bridge north to the Rollinsford town line. This rail yard serves as the functional interconnect to the New Hampshire North Coast (NHN) rail junction that begins in Rollinsford and heads north to the Lakes Region.

New Service

In 1999 rehabilitation work began on the ballast and ties for the main line and sidings in Dover to accommodate the planned late 2000 introduction of Boston-Portland Amtrak passenger rail service sponsored by the Northern New England Passenger Rail Authority (NNEPRA). Work was also completed (sponsored by the City of Dover and the NHDOT) which upgraded the rail crossings at Central Ave and Chestnut Streets and realigned Fourth Street to remove an at-grade crossing in the downtown core. In 2000 the main line track will be upgraded to seamless welded rail as part of the Amtrak project. This rail and tie replacement represents the first complete upgrade in the rail corridor infrastructure in over 30 years and signals the growing prominence of this mode for both freight and passenger travel. As the new century dawns Dover will again become a rail destination.



The City of Dover will become a full-time stop for the Amtrak service and is currently working with the NHDOT to construct an "Intermodal Transportation Center" at the Third Street and Chestnut Street train station site. This station will feature a fully accessible rail platform; intercity and regional transit bus amenities and a 1,000 square foot public multi-use space for passengers and residents of the City. The City established an Intermodal Station Committee in 1998 that meets on a regular basis to facilitate and manage the use of this facility.

The City plans to make this center a first class transportation hub that will also enhance the economic development and transportation opportunities for Dover residents and visitors. When Amtrak service arrives, the City of Dover will be less than 1½ hours of comfortable, direct travel to downtown Boston, Portland and, ultimately, stops north to Freeport, Maine.

As the rail line sees increasing freight and passenger train traffic, the City of Dover must begin to proactively develop and improve its rail related infrastructure and policies. The City will also need to proactively provide services, including adequate parking, to the traveling public that seeks to use the Dover station. See **Map T-9 - Urban Core Transit** for the location of the planned Intermodal Transportation Center and its relevance to the rest of the City's transportation network.

Recommendations

- *Encourage appropriate mixed-use development around the Third and Chestnut Intermodal Transportation Center* – The Third and Chestnut Intermodal Transportation Center will maximize the transport and economic development potential of the new rail service. This will also include development and use of the Center in a public-private partnership.
- *Develop the Intermodal Transportation Center to include public and private services* The Intermodal Transportation Center will be an open concept public space leased on a competitive

basis to private and public vendors and operators to provide complimentary services to the local and traveling public.

- *Encourage and solicit all modes of transportation modes connecting to the Third and Chestnut Intermodal Transportation Center* – Dover should encourage and solicit all modes of transportation service at the site and require regional public transit providers to make this a key central hub in the City.
- *Continue to advocate for the upgrade or removal of at-grade rail crossings* - Continue to advocate for the upgrade or removal of at-grade rail crossings in the city by use of Federal, State and local funds.
- *Continue to advocate for the upgrade or removal of low clearance bridges* - Continue to advocate for removal or improvement of low clearance bridges in the City by use of Federal, State and local funds. Of special concern are the low clearances of the Broadway Rail Bridge, the condition of the Washington Street and NH 9 Rail/Road overpasses. In a related matter, the Broadway Bridge structural integrity has been called into question due to frequent vehicle hits.
- *Advocate for the replacement of wood rail crossing structures especially the Oak Street Bridge.* This replacement should involve the active participation of rail line owners, the NHDOT, the City and rail service providers.
- *Educate the public and enforce rail safety including vehicular and pedestrian crossings and trespass programs* - This can be done by active support of the Operation Lifesaver program and full cooperation with the private rail owners and public operating entities.
- *Advocate for the State of New Hampshire's active participation in the northern New England rail network* - The State of New Hampshire's participation in the upgrade and use of northern New England rail network fails to take full advantage of Federal and State programs.
- *Actively participate in and coordinate with NNEPRA and Guilford regarding passenger service and freight/Intermodal service in the City.*
- *Work with private operators and public entities to explore the potential of the return of increased service to the Lakes Region including the potential of the return of passenger, commuter or tourist rail in the corridors.*
- *Update local ordinances and regulations to encourage the maximum benefit from increased passenger and freight/Intermodal use of the rail corridor with adequate consideration for public health, safety and general welfare.*
- *Fully integrate rail and rail travel issues into the new Dover Transportation Committee.*
- *Give adequate consideration to the view of Dover from the rail passenger traveler's perspective* - This may include cooperative efforts to beautify the corridor and make Dover an attractive destination point for travelers and business people.

Transit Facilities and Service

Traffic congestion is an unavoidable reality of our roadway system and of urban development. Congestion can be managed but not removed. Solutions will come in the form of a broader range of components. This will include utilizing more effectively the highway system we have in place. One way to accomplish this is through the effective development and maintenance of transit systems. This will allow us to increase the capacity of the existing system by offering alternatives that more efficiently make use of the system. Effective, attractive transit options can contribute to slowing congestion growth, reduce the growing strain on our roads, and provide a reliable, efficient alternative for those that use it. Transit will inevitably play an increasing role in transportation in the seacoast area and in Dover in particular as we develop a more comprehensive system to address the changing needs of the area and the City.



A network of public transit provided by the Cooperative Alliance for Seacoast Transportation (COAST) and the University of New Hampshire's Wildcat Transit service currently serves Dover. These systems serve the major north-south corridor of NH108 to Rochester, Farmington, Somersworth, and Berwick, Maine, south to the Town of Durham and the University of New Hampshire and onward to Portsmouth and Newington. These services provide a surprisingly comprehensive network from which to build a more effective, efficient transit system. In addition to fixed-route service, paratransit service is also available in some areas. These public transit services are outlined on **Map T-9 - Urban Core Transit**.

COAST

COAST is the region's major public transit provider, serving many communities in the seacoast area including Dover. COAST currently operates a mixed fleet with full-size 40-foot transit vehicles serving its urban routes including Dover. It also operates demand response paratransit services with smaller van vehicles. All vehicles are compliant with the American's with Disabilities Act (ADA). Dover makes an annual contribution to COAST operations as a community served by this transit provider. This contribution is used to match Federal funds that are 80% of the agency's budget.

COAST Route 1 and Route 2 serve Dover. Route 1 operates along the Central Avenue corridor in Dover from Waldron Towers on Green Street to Berwick, ME with stops in Somersworth. This route offers weekday service only with frequencies on an hourly basis for the most part. Route 2 operates along the Central Avenue corridor within Dover from downtown Portsmouth to Rochester, serving intermediary stops in Somersworth, and Newington. Weekday service frequency ranges between one and two hours between runs with reduced service on Saturdays and no service on Sundays.

COAST regularly tracks passenger boarding's and exits by each stop. This allows comparison with other previous data for possible service changes. Productivity within Dover is generally very good with the pattern of ridership showing the strong commuter patterns on COAST. A detailed representation of Dover boarding figures for the COAST transit routes is located in the Technical Appendix accompanying this report. Upon review of this data, one particularly important piece of information was the user group identified by the boarding trends. The highest levels of boarding's and departures are primarily at two places: Green Street/Waldron Towers apartments, a concentrated area of elderly residences, and the upper Central Avenue stretch of shopping plazas including Shaw's and Shop 'N Save. The analysis shows that the senior citizens of Dover are major users of the transit system. Other key locations of boarding and departures were the City Hall area, the Uhaul / middle Central Avenue area and St Thomas Aquinas High School.

University of New Hampshire Wildcat Transit

Wildcat Transit is a public transit provider, serving most communities surrounding Durham including Dover, Portsmouth, and Newington. Wildcat Transit also operates a mixed fleet of vehicles ranging from approximately 30-foot full size transit vehicles for its main intercity/town operations and many smaller van vehicles for local service in Durham, where UNH is located. These vehicles are also compliant with the American's with Disabilities Act (ADA), providing wheelchair access. It should also be noted that many of UNH's vehicles have bike racks on them to encourage bicycle travel to and from Wildcat bus stops.

Wildcat Transit routes serving Dover include Route 3A and Route 3B. These services each follow essentially the same routing using NH108 and NH155 between Durham and Dover. Route 3A operates along the NH Route 108 northbound from the core of UNH to Upper Central Avenue in Dover before returning to UNH via NH155 southbound. Route 3B serves essentially the same stops on the reverse circuit of the NH108 and NH155 loop. There are approximately 22 stops along the routes at full service with frequency ranging from hourly to every 2 to 3 hours during weekday service and lesser frequency on weekends. A late night midnight run operates on the weekends. During UNH vacations and summer break the routes operate on a significantly reduced schedule.

The most recent productivity analysis produced for Route 3 was conducted in 1997. While values have most likely changed a bit over time, the trends will still hold true for the most part. Some of the findings of particular note include that over 50% percent of the boardings on Route 3 took place on the Central Avenue corridor. Approximately a quarter of the Route 3 riders boarded on the upper Central Avenue or "Miracle Mile" corridor and another quarter board on the Lower Central Avenue to City Hall portion of Central Avenue. Many of Route 3's riders make their home in Dover as well and many still are University students, faculty, and staff.

C&J Trailways

The nearest intercity bus service accessible to Dover is C&J Trailways. C&J provides service primarily to Boston commuters, serving South Station, and Logan International Airport. On a typical non-holiday weekday, C&J has 13 runs per day leaving from the Pease Intermodal facility for Boston's South Station, another 13 leaving for Logan International Airport and also service leaving from Durham/UNH serving both Logan and South Station.

In January 2000, C&J moved its base of operations south to the recently completed Pease Intermodal Facility on the south end of the Pease International Tradeport in Portsmouth. Dover residents now have to travel south on NH16 to the Tradeport to access C&J service to Boston rather than simply park at the former C&J base of operations on NH155 in Dover. Benefits of this move for the company include closer access to the highway than the old C&J facility, added parking, and the added availability of other transit services such as the Pease-Portsmouth Trolley, that share the facility as a major stop or hub for local and regional service.

Connections to Other Modes and Services

The City of Dover is relatively rich in transit service in comparison to other communities in the region. The City has been a proponent of transit service, providing local operating match for COAST service for many years. This relationship should continue. While it is unfortunate that interstate service provided by C&J Trailways is no longer as easily accessible due to its move to the Pease International Tradeport, the service is still within a reasonable drive for Dover residents. The new facilities will be a dramatic improvement over those provided at the former location on NH155.

In some respects, the void created by the absence of the direct C&J service will be filled by the completion of the Intermodal Transportation Center planned for construction in Dover's downtown. Based around the train platform to be completed welcoming Amtrak passenger service in January 2001, the facility will be expanded to include additional parking and amenities. Coordination with existing and future

transit will place this facility on all transit routes. The City is also working to make bicycle and pedestrian connections to the Intermodal facility.

Recently, the City successfully secured CMAQ funding for a downtown trolley loop project. The funding will be used to work with COAST to establish a downtown loop transit service, providing high-frequency transit service in the central core of the City. This type of approach, in coordination with other congestion reducing efforts could lead to dramatically improved traffic conditions in the downtown area. It will provide a well-needed service, adding to the convenience of utilizing the public and private establishments scattered throughout the core of the City.

Dover should continue to support and participate in these transit activities and continue to include transit as part of the mix of options made available to its residents and visitors. Not only will this enhance the quality of life for many people living and passing through the City, it will serve to combat congestion. Remaining aware of the primary users of the system through coordination with the operators and continued cooperation with the providers in maintaining the system and making changes when necessary will lead to the best possible service provided. The City must stay responsive to user groups such as the elderly, children under 16 years old, disabled people, college students, and lower income citizens.

The City should continue to refocus these and future services as well as other modes around the construction of the intermodal facility planned for the train platform site that will serve Amtrak riders this fall. This facility will serve as a perfect connection for all modes in a centralized, accessible location and provide Dover with a great opportunity to promote these other modes of travel. Decisions about new development should make consideration for transit. By considering connection to existing transit service and working with transit providers during the design of new development, the City can effectively use transit service to its benefit. This will lead to better connectivity through transit. It is much more effective to integrate transit options into the planning and design process rather than trying to determine how to serve developed areas with transit after the fact.

Recommendations

- *Continue to be supportive of transit services in general*- the City should continue to work with and financially support current transit providers in an effort to strengthen these services and identify potential for expansion in the future. A portion of the auto registration fee collected by the City for transportation projects should be dedicated to operating support of transit services.
- *Encourage intercity bus service to the Third and Chestnut Intermodal Center*– C&J Trailways should be strongly encouraged to provide service to the CBD, so residents could walk to the bus. If this is infeasible, the City may want to explore a shuttle arrangement to connect the Dover Intermodal station with the Pease Intermodal facility on a regular basis.
- *Continue to pursue an intra-city transit loop* - Dover should continue to encourage the type of arrangement the privately owned local trolley serving the downtown mill buildings currently utilizes. Short-term operating funds for transit service is available through CMAQ program and could be used in collaboration with the downtown trolley to expand the service.
- *Continue to pursue reconstruction of a new vehicle bridge connecting River Street and Washington Street* - This would permit an expanded and efficient loop through the CBD. It could also be used as part of an effort to use peripheral all day parking outside of the CBD. This of course would have to be coordinated with the plans to redevelop the riverfront area.
- *Integrate transit into the development and redevelopment design process* The City should be thinking in advance about how transit can be integrated into development as development is designed. This should be especially true for development peripheral to the city core and for locations that will attract many potential transit riders such as large employers or business parks. This consideration should become part of the project review process.

Parking

The City of Dover must effectively and practically respond to the parking needs of downtown merchants, their employees, and customers. Providing access to convenient, safe, and well-maintained parking in the central business district (CBD) has been a subject of considerable discussion for the past several years. It is well recognized that the continued health and vitality of the CBD is directly linked to the ease of access. As Dover becomes more of a destination, and the shopping area and office buildings within the CBD achieve full occupancy, the demand on limited parking resources will continue to grow. However, the relationship between a healthy downtown and the supply of parking spaces is not simply a direct one. Parking must be considered in the context of all the modes of transportation made available to access the CBD and tailored to achieve the desired effect. An enjoyable, vibrant downtown area not only provides simple access by a means to arrive in the downtown, but also provides an environment conducive to pedestrians so they may window shop, moving from one establishment to another comfortably. Simply loading the downtown area with a large volume of non-market priced parking spaces placed without a thoughtful strategy will be counterproductive in the long-term.

"The perceived demand for unlimited free parking is so great that developers, city staff, employers, and retailers often underestimate the potential impact of parking management strategies. Implemented well, these strategies can control the supply and pricing of parking, help reduce congestion, and increase local transit use."

Source: Congress for the New Urbanism



The issues relative to the current state of parking within the CBD involve considerations of quality (visibility, convenience, accessibility, and locality) and quantity. Ideally Dover would have a mix of parking resources supplemented by frequent public transit service, easy pedestrian access, and bicycle parking. Such a system may include:

- Convenient, proximate short-term parking for access to retail establishments (2 hour or less)
- Flexible, user-friendly, and accessible managed parking for tourists and destination shoppers (1 to 3 hours)
- Controlled, safe, and brightly illuminated lots for extended parking for those who must have accessible parking during the work day and during the evening (2 to 4 hours)
- Peripheral parking with frequent public transit service for long-term and all day employee parking (4 or more hours).
- Long term improvements to peripheral parking lots that will become interconnected to the downtown by future trolley service. This may include a first class park and ride facility along the Spaulding Turnpike with direct connection downtown.

Presently, Dover has basic examples of each of these elements such as Chapter 170-44 of the City ordinance that provides for some flexibility in parking requirements. However, an integrated and effective parking system continues to be elusive. The current surge of economic growth, the arrival of intercity rail service and the redevelopment of the Riverfront may produce the momentum and resolve necessary to address this challenge comprehensively. As policy, the Master Plan supports a funded, comprehensive reorganization of the parking system in the City of Dover.

Analysis

Currently, within Downtown Dover there are approximately 1,500 public parking spaces with 800 on -street and 735 off-street parking spaces. About 161 spaces are operating under a meter-controlled system with a fee rate of \$0.25 per hour. **Table T-11 - Downtown Parking Supply** and **Map T-10 - Urban Core Parking** portray the existing parking supply within downtown Dover.

Together these public, as well as privately owned parking areas, must serve several needs of often competing constituencies. One group, typically but not exclusively employees and business owners, require accessible long-term, 4 to 8 hour parking. The balance, typically visitors and customers but also including a number of part-time employees, need access to short-term, 1 to 3 hour, parking. The use of 2-hour spaces, both on-street parking and off-street parking by a limited number full-time employees and business owners through the (illegal) practice of rotating vehicles between several spaces should be discouraged.

Table T-11 – Downtown Public Parking Supply

SERVICE CATEGORY	ON-STREET	OFF-STREET	TOTAL
2-hour limit	499	45	544
All day	299	55	354
Monthly permit	-	207	207
City employee permit	-	122	122
Library only	-	18	18
Metered	-	161	161
Leased	-	127	127
TOTAL	798	735	1,533

Source: 1993 Downtown Parking Survey, David Bujno

Recommendations

- *Bring the Parking system and enforcement process more aggressively into the transportation planning realm. Parking is not simple an enforcement issue– it is a planning and redevelopment issue.* Regularly evaluate parking within the CBD and propose changes based upon the changing users. A Parking Authority should be established under the coordination of the Transportation Committee. That authority should work on a combined transportation and economic development agenda and include close ties to the Planning, Economic Development and Main Street Program.
- *Continue to realize the benefits of on-street parking additions as a traffic calming measure.* Such measures can increase parking supply in areas where it is needed and at the same time serve to slow traffic in areas of high pedestrian activity. Dover already uses this technique in much of its downtown area and should continue to use this technique when conditions are appropriate.
- *Add a vehicle bridge parallel to the existing Washington Street pedestrian bridge–* An additional bridge at this location will improve the circulation in the very heart of the CBD. It will also permit easier access to parking along River Street. Additionally, a vehicle bridge at this location will permit an intra-city public transit loop to smoothly circulate around a more extend section of the CBD.
- *Consider supply strategies such as preferential parking for carpools.* Measures such as these have no infrastructure cost associated yet can have a positive impact on the availability of parking through the more efficient use of existing supply.
- *Encourage more peripheral parking and more private/public ventures in a coordinated downtown district pattern including a coordinated shuttle that builds on the existing millbuilding trolley.* This technique has proven successful with the mill trolley and should be expanded upon.
- *Continue use of on-street controls such as time limits and enforcement.* The City should also

investigate the use of 'smart meters' that use variable pricing, accept bank/credit card payments and refresh when spaces are emptied. The City should also evaluate mid block-parking receipt machines.

- *Continue to reduce existing minimum parking requirements (especially for lots within 2 blocks of public or private pay lots) through zoning. Continue to provide an opportunity for developers and redevelopers in the downtown to "cash out" of parking requirements in exchange for capital contributions supporting transit, parking or pedestrian infrastructure.* The City should review a policy establishing a per-space contribution fee related to the cost of city provided and maintained parking .
- *Investigate parking pricing strategies that would optimize the efficiency and efficacy of the parking that is currently available.* The City should embrace a more market based pricing strategy that offers differential rates to location. This would also include embracing new technologies to meter, regulate and collect revenue in lots. Smart-card meters, debit card lots and pass systems should be aggressively pursued. New meters should include upgradeable technology.
- *Encourage the highest and best use of CBD and Riverfront parcels.* Revamp taxation policies to discourage parking lots on valuable parcels of downtown land.
- *Establish maximum parking limitations.* Many cities like Dover only have minimum parking requirements for new development. This permits large retail establishments, usually not within the CBD area to pave massive parking areas to give likely patrons the impression of convenient parking.
- *Consider the long-term redevelopment of the parcel bound by the rail line, Third Street and Central Avenue.* This parcel should be considered for more productive use or for a long-term market-based parking and mixed-use facility in scale with the CBD, and the existing retail and housing needs. As surface parking only, this prime downtown parcel located adjacent to the soon to be constructed train platform could be more productively used. Ideas should be explored utilizing it as some combination of parking, businesses, and residences, coordinated with the downtown Intermodal Transportation Center and the rest of the core downtown area.

Bicycle Facilities

Interest in bicycling has increased for both recreational and transportation uses due to an increase in the public's concern for its health, the environment, and the availability of new technology that makes bicycling easier. Cycling grew faster than any other mode of travel between 1980-1990. Dover must continue to improve its infrastructure to respond to the demands of cyclists and the general population for better facilities and amenities for these transportation system users. Improved facilities and programs also serve to encourage people not normally inclined toward cycling to bicycle. The benefits to the municipality and its people are widespread, ranging from economic development opportunities to automobile congestion mitigation. A bikeway for instance provides a safe place for a non-polluting and inexpensive transportation mode, it may help to decrease traffic congestion and noise, provide a means for improved physical and emotional health, and provide inexpensive recreation. These benefits render a community more attractive for living, shopping, business, and working.

Many existing streets in Dover and throughout NH, to which bicyclists have the same rights and responsibilities as motorists, already provide minimum accommodations for bicycle travel in the form of some sort of shoulder. Unfortunately, many of these roads are unsafe for the inexperienced cyclist, because of their alignment, lane widths, traffic volumes, and high automobile speeds. Experienced cyclists can usually ride under existing conditions; but conditions outside residential areas are frequently too dangerous for inexperienced cyclists, who constitute most of today's riders. Bicycle-vehicle accident characteristics reflect the inexperience of bicyclists and motorists interacting with one another. Bikeways designed for transportation, recreation, or combined use can correct these situations. This majority of potential users are the group for which better biking facilities and programs are needed, if they are to be encouraged to use their bicycles more frequently for daily short distance trips.

Types of Bicycle Facilities

Shared roadway lanes – Shared roadway lanes are paved areas attached to roads, which are striped and marked for bicycle use only. They are otherwise seen as widened shoulders along roads.

Bicycle lane or path – Bicycle lane or path is used herein to define all facilities specifically designated for bicycle travel, which have separate right-of-ways.

Bikeway – Bikeway is used to describe all types of bicycle facilities whether a shared roadway lane or bicycle path

Transportation vs. Recreation

Bicycles are an excellent mode of transportation for adults commuting to work, shopping, socializing, and, given safe facilities, for children in their travels to schools, playgrounds, and after-school activities. The value of the bicycle in serving these needs has been frequently forgotten or ignored in NH and this country, but the bicycle may be the cheapest, and sometimes fastest form of urban transportation for trips of less than 4 miles. This means that about 39% of commuters in Dover could realistically consider using a bicycle as transportation during spring through fall.

A *recreational bikeway* differs from a *transportation bikeway* in that it is not designed primarily for people to move one point to another. Rather, it is designed as an end in itself for people to spend time in a relaxing way. Purely recreational bikeways are not funded as well by Federal transportation programs. It is preferable to separate recreational bikeways from all motorized traffic. If roads must be shared, they should have low traffic volumes and shoulder widths sufficient to accommodate motorists and bikes. Abandoned railroad beds, utility right-of-ways, sewage easements, or other linear right-of-ways can be used in this way, though many of these types of facilities, especially railroad beds can serve a legitimate transportation function. When possible, bicycle facilities should be designed to serve transportation needs as well.

Recreational bikeways should be designed so that casual cyclists can travel from one end to the other

and back again in a few hours or less, with time out for stops along the way. Provisions for adequate automobile parking at recreational bikeway termini allow people to transport their bikes to and from the bikeway by car. A recreational bikeway is designed as an end in itself. It provides a means by which people can make use of their leisure time in a healthful, relaxing way. This means the bikeway should run between 2.5 and 10 miles. It may be helpful to provide picnic area with tables, water fountains, and restroom facilities. People would then have three reasons to use the path: to get out of doors, to exercise, and to picnic. These service areas would also function as added points of destination.

Today's vehicles are more fuel efficient, but significantly more vehicles are now operating and driving on average more miles. In 1990 in the private motor vehicles consumed 1 31.7 billion gallons of fuel. This burden on our resources is particularly noteworthy, since approximately 39% of all commuter trips in Dover are 4 miles or less or 15 minutes or less. As stated, with safe, adequate infrastructure many commuters could seriously consider using bicycles.

The City of Dover would be serving the health, transportation, and recreation needs of their residents by providing more and better biking facilities. They would also be assisting in the improvement of the social and natural environment and in the reduction of petroleum consumption. Additionally, increased biking may, through more and better facilities, result in less traffic, reduced congestion, air quality improvement, and lowered noise levels. All of these factors contribute to the City's attractiveness and offer positive reasons for their implementation.

Bikeway Location and Delineation

Deciding where to route bicyclists, and what type of facility is appropriate in different settings are fundamental decisions in planning a bikeway network. The following figures can assist in making those decisions. With regard to making decisions as to which existing roadways to route bicyclists on, it is suggested that consideration be given at least to traffic volume and shoulder width. The following figure outlines the range of possibilities. The

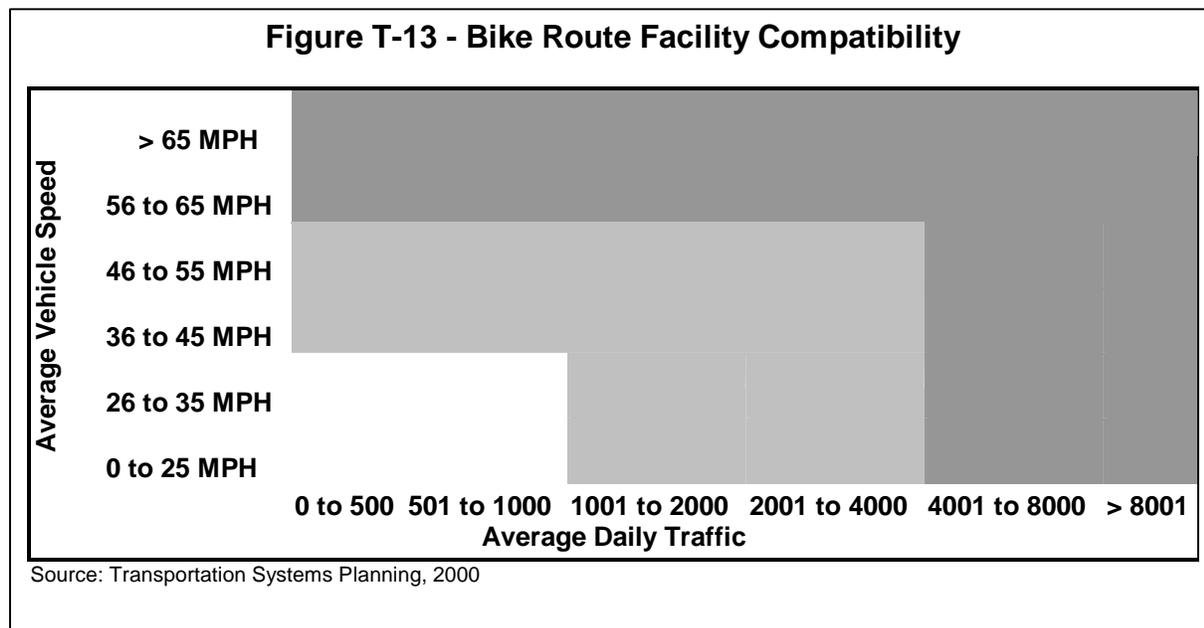
ideal roadway bike route would have a relatively wide shoulder and relatively low traffic volumes. Conversely, the worst roadway bike route would consist of no shoulders and high volumes of traffic.

Figure T-12 - Roadway Bike Routing

AADT	Shoulders			
	WIDE 4' or greater	MEDIUM 2' to 4'	NARROW 1' to 2'	NONE
LIGHT - < 2,400 AADT	Best	Best	Good	Good
MEDIUM - 2,401 to 4,800 AADT	Best	Good	Good	Bad
HEAVY - 4,801 to 10,000 AADT	Good	Bad	Bad	Worst
VERY HEAVY - 10,001 to 20,000 AADT	Bad	Bad	Worst	Worst

Source: Based on FHWA Draft of Similar Table, 1999

Another criteria critical to choice of type of bicycle facility is speed of vehicular traffic. This factor along with traffic volumes will determine whether a roadway facility is inappropriate for bicycle travel. The following figure outlines when it is appropriate to route bicyclists on existing roadways and shoulders, and when, due to excessive vehicular speeds and high average daily traffic volumes, it is more appropriate to provide a separated facility for the bicyclist.



Bicycle Parking

Parking facilities are an important component of a bicycle system that should be provided if bicycling is to be seriously encouraged. They can be effectively installed at shopping centers, business districts, recreational areas, bus stops, train stations, park-and-ride lots, and other locations that generate bicycle travel. Parking can be located in areas peripheral to destination points in order to stimulate bicycle travel. Bicycle parking facilities can be matched to locations and sites according to which kind of bike use is appropriate.

Facilities for bicycle parking are more economical in terms of land and money than are facilities for automobile parking. A study by the Philadelphia Bicycle Coalition found that 14 bicycles could be parked in the space needed by one car. A bicycle consumes, at most, 14 square feet.

This low space requirement and the lack of need for maneuvering, means a bicycle can be parked with little or no wasted space. It can be parked in the space left over for other uses, provided that it is well situated for easy accessibility and visibility. Ideally, protection from the elements should be provided. This may be especially important now as many people are investing more money on equipment and are more likely to use their bicycles as transportation if they are presented with a safe means to park and store their bicycle when not in use.



Bicycles with no proper storage facility

Analysis of Existing Bicycle Infrastructure

Dover's existing and potential future designated bikeways are found on **Map T-11 - Bicycle Routes**. The City is part of the regional bicycle networks as defined by the Seacoast MPO and NH DOT. For practical purposes, this provides some framework and footing on which to pursue funding for bicycle facility projects. It hopefully also provides some sort of basis psychologically on which to promote bicycling in the city and region. Roads such as NH155 and NH108 are especially important in the overall scheme since they provide direct access to the Durham/University of New Hampshire area. This commute is in the range of 4 to 6 miles and serves the age and demographic cross section of people who are likely to be active bicyclists. Encouraging them to take advantage of this mode of transportation should come in the form of establishing and maintaining facilities on key routes such as these. For the most part, these routes are adequately maintained with up to four-foot shoulders in most sections.

In the downtown area, bicycling is a bit more of an intimidating prospect due to high traffic volumes and substandard facilities. Luckily, lower vehicular travel speeds ameliorate this deficiency. In most cases, bicycles and cars share travel lanes at speeds under 20 mph. From the standpoint of congestion, a bicyclist can most likely get around town easier than an automobile driver. Still, from a safety standpoint, conditions are not ideal for the inexperienced cyclist. The City should keep in mind this paradox when considering alterations to the downtown area traffic system. In the downtown area, bicycle lanes and other appropriate facilities such as bike racks and signage making automobile drivers aware of the presence of bicyclists should be considered. These improved facilities will serve the present cycling population and also encourage those not quite convinced of the safety and efficiency of this form of transportation.

Recommendations

- *Actively propose bicycle projects under NHDOT's Transportation Enhancements and Congestion Mitigation and Air Quality Improvement programs* – Recently Dover has been very successful in getting funds under both of these programs. Dover should continue its active participation and continue to look for new bicycle projects.
- *Provide bikeways throughout the city* - Shared roadway lanes and bike paths are the best solution to the dangers of bicycle-vehicle conflicts. Inexperienced cyclists need a chance to improve their skills for riding in traffic. They need alternatives to existing conditions on roads with heavy traffic that offers improved predictability and visibility for them and for motorists. Well -designed shared roadway lanes or bike paths serve this need.
- *Encourage the use of bicycles for transportation*– Increased bicycle use by commuters and for other short trips could substantially reduce traffic volumes and congestion. Bicycles exclusively are not a panacea, because of winter weather. Increased bicycle use will only occur if complimented by intra - city public transit service.
- *Provide well lit, safe, and convenient public bicycle parking in the CBD* – Bicycle parking must be more than metal racks pushed against the side of a building. Facilities should be in areas directly linked to the sidewalk and pedestrian system. Bicycle parking should be provided and located on or near bikeways, bus stops, park-and-ride lots, or independently in the CBD.
- *Encourage new developments and redevelopment projects to provide bicycle parking*– These parking facilities need not be big, 4 or 5 bicycle lockers located in a building's lobby is sufficient. Planning Board applicants should be required to provide bicycle parking. An incentive based system might be developed through reduced parking requirements.
- *Educate children and parents about the safety in biking to school*– Many parents, who now drive their children to school, are very concerned about the children's safety. An education campaign and, probably, a bicycle-police patrol or mounted police would alleviate at least some parental fears and

train children to become better cyclists. The education campaign will be further aided as new bicycle facilities are constructed.

- *Appropriately locate bikeways* – Using either of the two figures from the text to appropriately locate each new bike path, shared roadway lane, or shared roadway. By using either of the two figures from the text residents can easily see what type of bikeway is reasonable for their road and surrounding roads.
- *Regularly clean the full width of all roads* - This requires that debris be regularly removed from the sides of roads and shoulders, and that potholes are promptly repaired. Storm grates with elongated slot openings that trap bicycle wheels will have to be replaced with safer designs or recessed into the curb-line. If replacement is impossible, grates should be painted with warning lines.
- *NHDOT and the City should provide full width paving when resurfacing roadways.* This should apply universally but especially on routes that have been specifically designated as part of the State, MPO or City bike network.
- *Preserve railroad right-of-ways for future transportation corridors* - it is important to preserve unused railroad corridors for future uses whether that be bicycle paths, multi-use paths or the eventual re-establishment of rail service.
- *Enforce the laws of the road as applicable to bicyclists.* This leads to a safer relationship between motorists and bicyclists and fosters a better relationship and respect among the various modes of transportation.

Pedestrian Facilities

The adverse implications of increased traffic volumes for all users of the transportation network in Dover have long been recognized. The City has, through implementation of the last iteration of the Master Plan, attempted to accommodate motorized vehicles, but has not always considered the convenience and safety of those walking in urban, suburban and rural area. Recently, the fields of transportation and community planning have begun to acknowledge the critical importance of pedestrian rights and accommodating those who wish to walk to fulfill basic transportation needs, for recreation, or for leisure. Dover also has begun to take strides in this direction, working on a comprehensive pedestrian plan for the City and implementing effective tools such as the new pedestrian crossing signs.

The ability for people to conduct at least some portion of their daily travel and activities by walking is an important part of community life. If we are constantly using mechanized means of travel, especially the automobile, often with only the driver inside, we lose the sense of connection with the world around us. In order to keep that connection, and to encourage a sense of community and connection with our towns and cities and the inhabitants within them, we need to provide certain opportunities.

Proper pedestrian facilities are essential to encouraging and promoting this sense of community and livability. Walking also reminds us of

the fast pace we often live our lives in and become consumed by. We experience many things on a 1 - mile walk that wouldn't register in a speeding car.



“All trips begin and end with a pedestrian – walking component”

There have been many studies documenting the importance of pedestrian facilities as a component of a complete transportation infrastructure. Some of the findings of these studies are:

- Pedestrian volumes are related to site and pedestrian facilities design.
- A substantial number of people walk outside of the downtown core for recreation
- A disproportionate number of pedestrians are young people (under 16), elderly, or physically challenged people.
- Most people prefer to walk on sidewalks.
- A high incidence of jaywalking pointed to potential safety problems and indicated that pedestrians lack practical, well-designed options in their walking routes.
- Schools generate large amounts of pedestrian traffic and should receive additional attention

Beyond the lack of infrastructure, many barriers exist which prevent safe walking conditions for pedestrians. Land use greatly influences pedestrian travel. Strip development that exists on many roads creates an inhospitable and often unsafe environment for pedestrians. Modern commercial developments are typically designed with large parking lots that are difficult to cross on foot, and generally offer no other safe or convenient access from the street to the building entrance.

Some other obstacles to safe pedestrian travel include:

- Poorly designed, poorly maintained sidewalks
- Poorly marked, lighted or signed crosswalks (from a pedestrian and driver perspective)
- Signal timings that are too short for the walking speed of an average person trying to cross the street
- Inadequate treatments for pedestrians with disabilities
- No consideration given to walking amenities, such as benches, protection from sun or wind, and landscaping
- Long distances between residential, commercial or employment areas due to land development patterns
- Utility poles, parking meters, signposts, low trees, or other barriers placed in the sidewalk

“The ability for people to conduct at least some portion of their daily travel and activities by walking is an important part of community life. If we are constantly using mechanized means of travel, especially the automobile, often with only the driver inside, we lose the sense of connection with the world around us. This is an especially

Walking Behaviors

Journey-to-work data from the 1990 Census for the City of Dover indicates that **4.5% of the daily work trips are by pedestrians**. This is slightly higher than national averages where pedestrian trips total 4.0%. A later National Personal Transportation Study revealed that when **considering all possible trips, not just journey -to-work, pedestrian trips rise to 7.2%**. While these percentages may seem relatively low, it is almost certain there is some amount of latent demand for pedestrian facilities that would surface given the opportunity.

"Transportation professionals often talk of "Level Of Service" when discussing the effectiveness of a roadway to serve vehicles - we should think in these terms too when considering how well we serve other users of the transportation system such as pedestrians..."

Source: SRPC staff

Such is often the case with pedestrian and bicycle facilities and amenities that once the opportunity presents itself or becomes more attractive, people that wouldn't walk or bike under old conditions will now participate. The City should continue to provide improved facilities and amenities for pedestrians in order to encourage walking and tap into this latent demand.

Sidewalks

The goal of the City is to strive for a continuous system of high quality, connective sidewalks to provide safe and convenient transportation purposes. In Dover, sidewalks are centered primarily in the urban areas and downtown core, although as new subdivisions are created and existing roadways are reconstructed, sidewalks are being refurbished or added. This process shall continue in the expanding urban core in residential and mixed residential/commercial areas. While some of these new facilities may not immediately tie in to the adjacent urban core system of sidewalks maintained by the City, they should be implemented with an outlook towards a twenty-year horizon of growth and urban expansion of the sidewalk system. **Map T-12 - Urban Core Sidewalks** details the existing pedestrian system in the City. It should be noted again that the City Community Services Department has a sidewalk improvement program that is currently funded in the City CIP. Sidewalks are also now eligible for funding from the Transportation Enterprise Fund. The City uses a geographic information system (gis) to track existing conditions, display existing sidewalk systems, and identify proposed connecting links.

Crosswalks

Another extremely important component of the City's sidewalk system and pedestrian facilities in general are crosswalks. Crosswalks are more than just painted lines on the ground. They serve as a "bridge" across the "river" of pavement they cross. Without a crosswalk, a pedestrian is simply floating in that river, with no definition of a safe place to cross the road. Motorists alike don't know what to expect in a section of road with no or poorly defined crosswalks, waiting for a pedestrian to cross at any moment. Crosswalk placement cannot happen in haphazard fashion. Too many crosswalks can be as bad as not enough. The most effective crosswalks are those that use reflective paint, are well lit, and placed as logical extensions of the sidewalk system they tie together. **Map T-13 – Crosswalks** details current official crosswalks maintained by the City and highlights general zones where new, properly designed crosswalk facilities should be established. The City uses a geographic information system (gis) to track existing conditions, display existing crosswalk amenities, and identify proposed improvement sites. Residents should direct inquiries regarding the status or need for crosswalks to the Community Services Department.

City Process regarding Crosswalks

Locating a new crosswalk or making modifications to existing ones is a process that often begins in the community. Once a concern is voiced to the Parking and Traffic Safety Committee it will be studied by the Planning Department and addressed by the City Planning Board. Their recommendation will go to the City Council. The City Council will ultimately decide what action to take.

Crosswalks are simply an extension of the sidewalk system. They are not a luxury or extravagance. The Dover Transportation Committee shall work to ensure that the Community Services Department is supported programmatically and fiscally in improving the quality and quantity of crosswalks in the City.

Added Benefits of Pedestrian Facilities

Many communities in the United States are now exploring measures beyond sidewalks that place pedestrians and other non-motorized modes of travel on a more even level with motorized traffic. These measures, collectively called traffic calming, use physical design of the roadway to prevent inappropriate automobile speeds. They are not intended for roads where the primary objective is to move traffic quickly through. Most often, they are used in residential areas where residents see the road as part of their neighborhood and a place where walking, biking, and social interaction can safely coexist with motorized traffic. These types of practices are particularly applicable to the downtown area of Dover as well as the many individual neighborhoods within the City. These techniques go a long way in providing safer facilities not only for pedestrians but also for all users of the transportation network.

Traffic Calming Techniques

The potential benefits of traffic calming include reduced traffic speeds, reduced traffic volumes (by discouraging "cut-through" traffic on residential streets), and often improved aesthetic quality of streets through landscaping associated with the techniques. All of these are to the benefit of the pedestrian. Some of those techniques are:



Modern Roundabout

Not to be confused with a traditional New England high-speed rotary or traffic circle, this is an intersection treatment that forces motorized traffic to slow down to speeds less than 25 mph in order to negotiate a center island that can be landscaped. Such speeds allow pedestrians to safely cross around the perimeter of the roundabout and bicyclists to safely become part of the circulating traffic. This technique can be effectively implemented in a low speed, low volume neighborhood desiring to keep traffic from becoming too high in either of these two characteristics. Where the right conditions exist, this can also help control through traffic using a residential neighborhood as a short cut to a more appropriate travel route.

Speed Humps, Speed Tables, Raised Crosswalks, and Striping

All these techniques involve raising the height of the pavement or providing visual queues for the motor vehicle operator in a more subtle fashion than a traditional speed bump, allowing vehicles to pass over them at the intended speed of the road, but preventing excessive speeds and alerting drivers to the existence of non-motorized users. The City has used techniques such as these in residential areas suffering from high speed cut through traffic. An example of a speed hump is Willand Ave (shown here in photo). While the volumes are likely similar to before implementation of the speed table, the speeds have been significantly reduced. The net result is lower vehicular speeds and a safer environment in a neighborhood environment by requiring drivers to check their speed, all for a relatively small investment.



In a particularly pedestrian oriented setting such as a downtown area, raised crosswalks in particular accommodate pedestrians by allowing them to cross at the same or similar elevation as the existing sidewalk while again slowing vehicular traffic through offering a change in road surface and visual environment.

Painting techniques such as providing colorized or reflectorized crosswalks to bring attention to pedestrian crossings, and striping techniques to provide visual queues can provide an even less expensive method by which to alter motor vehicle operator behavior. Striping areas for parking, neck-downs, and narrowing lane widths (only to acceptable standards of course) can have

an impact on driver perception and hence, actions. Such techniques might be tested in the downtown urban core on Central Avenue or other locations in order to keep traffic speeds in context with the pedestrian oriented environment. Painting is of course one more item that needs to be maintained on a yearly basis, especially in such a climate as Dover's. However, it can still provide an inexpensive option under the right circumstances.

Chicanes, Medians and Widened Sidewalks

These techniques effectively narrow road width and slow down traffic by placing a physical impediment either in the middle of the road (median) or on the side of the road (chicane). These lend themselves to landscaping and improve the visual experience for all users of the road as well as reducing speeds. Both techniques can provide additional safety for crossing pedestrians; medians may serve as a refuge by allowing pedestrians to cross one lane of traffic at a time, while chicanes provided at crosswalks (curb bulbs) reduce the overall distance from one side of the road to another and slow down traffic at those crossings. Dover has used some of these techniques in the downtown area. Of particular note are the

areas around the mill center and Central Avenue north of the Mills. Here, the effect is not only to provide some identified channeled locations for pedestrian crossing but to guide the vehicular traffic as to where to expect increased pedestrian action. The result is an environment that is safer for both users of the system.

Other communities in the region are beginning to take interest in some of these techniques. The City of Portsmouth has installed curb bump-outs at some crosswalks to safely accommodate the high volumes of automobile traffic and pedestrian traffic. A similar project was just completed in Durham with much success. In Dover, the Sixth Street Neighborhood Committee has begun to look at traffic calming as a possible solution to high speeds and through traffic on their residential street. Curb bump-outs are being considered as part of the design of this reconstruction. Through their organized efforts, the Sixth Street Committee will have an effect on the current reconstruction project on their street reflected by the inclusion of improved pedestrian facilities.



New Development

Once pedestrian goals are discussed in a community master plan such as the one this chapter is part of, a foundation is established for building pedestrian accommodation into local and land use regulations. With regard to new development, the City can and should require certain improvements of the developer as part of their negotiations. Ordinances and regulations are the most effective means of implementing land use and transportation improvements. With pedestrian provisions in effect, developers will be required to plan for pedestrian

walkways in a similar manner to planning for the automobile. Suggested textual amendments for zoning, subdivision, and site plan regulations are available from Strafford Regional Planning Commission.

Integration into the Planning Process

Key to the success of creating a more pedestrian friendly and functional city is for public works officials, planners, and local officials to include pedestrian issues in their planning process. This requires very serious thought about the accommodation of pedestrian movement. The

The process of integrating pedestrian considerations into local transportation planning, design, and operations has become known as "institutionalization." A number of key elements, which -- in part or in whole -- will lead to "institutionalization", are:

- **Regulations and ordinances, regarding pedestrian access requirements for new development**
- **Pedestrian considerations written into roadway design practices**
- **Plat review and site plan review to consider pedestrian facility provision and facility network impacts as review elements. This should also include encouraging the NHDOT to incorporate design elements that encourage pedestrian activity in projects they are building**
- **Training of City staff about bicycle and planning considerations in the planning and design process**
- **Establish regular maintenance programs to identify and correct problems as quickly as possible**
- **Educate citizens about pedestrian issues and needs.**

accommodation of pedestrians should become an automatic and routine part of community planning, zoning, and transportation studies. Support for pedestrian improvements must be built within the community by identifying all of those people and organizations concerned with pedestrian circulation or transportation issues, asking about their needs and opinions, and keeping them informed of the planning process. Implementation of the actions requires continued participation from all those involved in developing the plan. Citizen involvement in the planning, development, and operations of pedestrian programs is vital to program success.

Walking and Schools

The determinant of whether a student will be provided bus service to and from school in Dover is location relative to the school the student is attending. Elementary students living inside a one-mile radius from their school must find alternative means of travel to school. Middle school students within a 1.5-mile radius, and high school students within a two-mile radius must find alternative means of transportation to school. This system provides the City with an opportunity to influence the travel behaviors of these residents and a responsibility to provide appropriate facilities to enable and encourage the use of bicycles and walking to travel between home and school.

The City must be particularly responsive to system deficiencies in these areas. Efforts must be made to provide proper facilities for students and parents to exercise the option of walking. Many parents may feel walking is too dangerous because of improper facilities or the possibility of harm coming to their children because of vehicle-pedestrian conflicts. These fears can be dispelled as more people walk, providing a positive presence on these sidewalks and paths. Another possibility is "Walking School Buses". This consists of an adult, theoretically a parent of one of the students or perhaps a senior citizen, who commits to walking a route to school each day all the while picking up children on the route and "shepherding" the students to school. Establishing this type of a program enables more children to walk to school without their parents having to be so concerned about safety issues that revolve around vehicle-pedestrian conflicts. This would also lead to decreased use of automobiles for short trips and more of a sense of community within neighborhoods.

Recommendations

Dover's non-downtown corridors, the Riverfront Redevelopment Area and the existing downtown should host a mix of land uses with relatively high population densities combined with densities of retail and office development. The zoning of the future centers and downtown should have, on average, 50% of the dwellings units falling within a 1/2 of a mile or less from the necessary commercial/retail centers. This would provide a land-use distribution and intensity that is conducive to pedestrian travel. More than anything, the City should be cognizant of the effects that other planning decisions have on the "walkability" of the City.

A connected system of safe and accessible sidewalks is needed to encourage walking as an alternative to the single-occupant motor vehicle. The key factors associated with safe and accessible pedestrian facilities include continuity of facilities, on-road intersection needs, inter-modal linkages, and maintenance. This should also take into consideration applicable standards such as those required by the Americans with Disabilities Act (ADA). As a result of this act, all sidewalks must include curb cuts with sloped access to streets or at-grade crossings. Pedestrian crosswalks at intersections provide a defined space where pedestrians can cross a roadway and where motorists are made aware of the potential of pedestrians in the roadway. Crosswalks should, when possible, provide pedestrian crossings at intersections and walking signals.

Community Services shall be directed by the Transportation Committee to provide continuity to the pedestrian system, which will, in turn, encourage more pedestrian travel. Lack of sidewalks or gaps in the sidewalk system are significant obstacles to pedestrians, especially to those with limited mobility or the elderly. A barrier-free network is necessary to provide adequate space for pedestrians and to remove

restrictions to optimize use. It is also important to note that pedestrian access is the predominant means of access to public transportation. Provided there are no barriers, pedestrians will typically walk about 1/3 of a mile to destinations such as work, school, shopping, and other activity centers. Therefore, the links to transit centers are important to any significant increase in pedestrian travel.

- *The Dover Transportation Safety Committee shall consider pedestrian and traffic safety issues a core responsibility.* This Committee should serve as the sounding board for public input that results in recommendations to the Transportation Team – Community Services, Planning Department, and the City Manager. The Committee should use the gis and map database to identify priority connecting sidewalk links to be constructed as part of the sidewalk program included in the CIP.
- *Continue to fund the sidewalk maintenance program as a standalone item in the City CIP.* If funding for this purpose is minimized or cut, finding funds for this purpose will cause other maintenance responsibilities of the Community Services Department, such as road surface maintenance, to become neglected.
- *Make land use and ordinance decisions that facilitate and encourage walking*– Small suburban centers with a mix of land uses, including high-density residential, commercial, retail, and combined with adequate pedestrian facilities will permit and encourage walking as a viable mode of transportation.
- *Promote pedestrian specific facilities* – Dover should continue to address pedestrian needs and fill gaps in its existing sidewalk network. For new development or redevelopment it should require the installation or renovation of all pedestrian facilities. Areas of high intensity retail development in the recent past have not received adequate pedestrian features. In the future, high intensity retail development should have sidewalks that connect to existing or potential future pedestrian facilities.
- *Investigate the potential for the addition of traffic calming features in appropriate locations* - As outlined above, traffic calming features such as bump -outs, speed tables, raised colored and textured crosswalks and other techniques can make for a safer environment for pedestrians and vehicular operators alike. The City should clearly define the process by which neighborhoods would request traffic calming improvements.
- *Institutionalize pedestrian facilities into all City projects and decisions*– Dover should always consider the impact on pedestrians when creating new ordinances, developing road reconstruction designs, and maintaining the road network.
- *Actively propose pedestrian projects under NHDOT's TE and CMAQ Programs*– Recently Dover has been very successful in getting funds under both of these programs. Dover should continue its active participation and continue to look for new pedestrian projects.
- *Educate children and parents about safety in walking to school*– Parents currently driving their children to school are very concerned about the children's safety. Lack of adequate facilities and perception of lurking felons causes parents to not permit their children to walk to school and many other daily trips. Education campaigns including popular programs such as bicycle-police patrol and mounted police would alleviate at least some parental fears and train children to become more regular walkers. Programs such as "Walking School Buses" (see text) can also serve to increase the number of students walking to schools.
- *Regularly clean sidewalks and pedestrian facilities* - This requires that debris be regularly removed from sidewalks and pedestrian facilities. Potholes and other poor surface conditions should be promptly repaired. Sidewalks and pedestrian facilities need to receive equal priority as snow removal on roads.
- *In an annual process, the Transportation Committee will solicit feedback from the community and consult the current GIS database in order to reevaluate the crosswalks in the City. The City shall*

remove ineffective, unnecessary or dangerous ones, and place new ones where they would provide the most benefit and safety. The City should also institutionalize the use of reflective paint for these facilities and create lighting standards. The City should work with the NHDOT Bureau of Traffic to create an advanced signing standard and explore overhead lighted signing at major crosswalks.

- *Incorporate the maintenance of crosswalks into the regular maintenance of the adjacent sidewalk system.* Crosswalks are important facilities. They are extensions of the sidewalk system and need to be maintained as such.
- *The City Transportation Committee shall coordinate with and solicit feedback from the School Department Transportation Committee regarding crosswalk safety issues on a quarterly basis.* The Committee and the Community Services Department will actively solicit input from the School Department as it prepares its annual sidewalk and crosswalk program for the CIP.

Ridesharing and Vehicle Trip Reduction

Ridesharing is a common-sense method to reduce traffic volumes, alleviate congestion and mitigate air pollution. The State and City are working to provide facilities to make it possible for people to share rides to common locations in the hopes of reducing congestion, improving air quality and improving mobility. Additionally, coordinated and casual ridesharing can increase travel options for those not able to own and operate their own vehicles. That expense, which is the second highest household expense, after housing costs, is estimated to be over \$400 per month for the average vehicle. Still, the reality is that most commuters drive alone and will continue to do so. 1990 Census figures estimate that 78% of commuters in our region drive alone. This is less than the national average and we should work to keep it that way.

Seacoast Commuters

Commute Alone	78%
2 – 3 riders	14%
4 or more riders	<1%

Source: 1990 Census

Rideshare Programs and Facilities

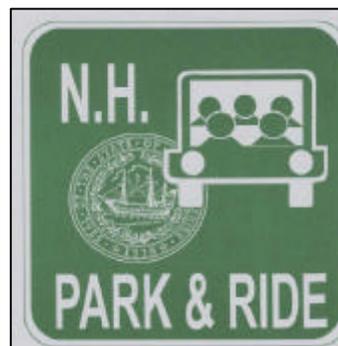
NH Rideshare

The NH Rideshare program, initiated in 1996, is dedicated to finding alternatives to the single occupancy vehicle for commuters. Run by NHDOT, it serves as a clearinghouse for information on carpooling, ridesharing, vanpooling and Park-and-Ride facilities available throughout NH.

Park-and-Ride Lots

Dover has two official park-and-ride lots. One is located at the former C&J Trailways bus terminal on NH 155 and one is located on NH 4, Portland Ave., North of the downtown at the Dover Arena. The Arena lot is scheduled for upgrading with improved surface and amenities as part of a successfully funded Congestion Mitigation and Air Quality (CMAQ) improvement grant. This serves commuters sharing rides to the Portsmouth Naval Shipyard and other points east of the City, such as southern and coastal Maine locations. It will also be a terminus for the Dover Downtown Trolley service scheduled to start in 2003-2004. The NH 155 lot will likely be phased out in the coming years and the region is advocating for a replacement facility in the NH 16 corridor, north of Exit 8.

A Park and Ride facility at this location would effectively serve the community for many reasons. This site provides commuters with convenient and close access to and from the Spaulding Turnpike. Visibility from the turnpike would allow easy identification from the turnpike. The existing NH155 facility is a bit too far from the Turnpike to be appealing for the north-south travel of the turnpike. A new facility would also serve the east-west travelers currently using the old NH155 lot. A new facility at Exit 8 has potential to also serve as peripheral parking for the City's Intermodal Transportation Center in the downtown. As this downtown hub becomes more heavily utilized, this satellite location off the turnpike would provide additional and/or long-term parking, as well as serve as a shuttle stop to keep added traffic out of the downtown as travelers enter the City to access the upcoming train services.



Ridesharing at Large Employers

In the 1970's, it was not uncommon for large employers to have ridesharing programs with several vanpools. To this day, employees of the Portsmouth Naval Shipyard run a vanpool to and from the Shipyard from a park and ride lot on NH4, just outside of the Dover downtown. Unfortunately, this type of program lost some of its appeal over time as the economy of the 1980s strengthened, people's travel day has grown to include more trips and gas prices have remained relatively inexpensive.

Programs are now being developed that use new Federal tax incentives to provide tax-free benefits for transit and carpool use. The University of New Hampshire will be starting a model vanpool program that may be applicable to other large employers. This is a good idea for business, which will gain access to a new pool of employees. It also is a plus to participants due to reduced travel expenses and tax breaks.

Vehicle Trip Reduction

Of equal importance, the City should coordinate all of its land use ordinances, regulations and subdivision review processes to build in options for the single occupant vehicle in new development. This includes allowing higher density, mixed use development in the downtown areas to reduce the need for vehicle trips and 'designing in' safe and effective pedestrian and transit facilities. The City should create an environment that is not dependent on the car; this will go a long way to reducing trips, reducing congestion and producing a more livable community. In a sense, the City should look for modern, functional interpretations of its historical development patterns as the answer to this modern day challenge.

Recommendations

- *The City should encourage its residents and major employers to promote ridesharing opportunities locally and regionally.* By providing facilities, such as the expanded park and ride at the Dover Arena, Dover's residents are encouraged to take part in these congestion-mitigating activities as better facilities are provided.
- *The City should pursue the construction of a first-class NHDOT Park and Ride facility north of Exit 8 on the Spaulding Turnpike.* This facility would have direct access from NH16 and be linked via Dover Trolley service to the downtown Intermodal Transportation Center, connecting travelers to Boston-Portland Amtrak service as well as providing a park and ride that facilitates ridesharing in all configurations of travel north, south, east, and west. Providing access to these parcels will also provide opportunity to put industrially zoned land into use.
- *To the extent possible, the City should continue to encourage the type of arrangement the local trolley serving the downtown mill buildings currently utilizes.* Incentives should be provided to encourage this type of program. As recommended in other sections of this plan, the City should also keep in mind the available funding sources for these types of projects.
- *Review all zoning, subdivision, site plan and land use policies* to encourage mixed use, development that is not completely dependent upon vehicular access.
- *Encourage ridesharing for residents and for commuters to Dover* Dover should continue to try to increase the percent of ridesharing and/or reduce the need for single occupant vehicular travel downtown.
- *Continue to propose appropriate trip reduction projects that are market based, enhance the mobility and accessibility in the City and provide users with realistic travel choices.*

Transportation Access to Recreation Facilities



Dover has many recreation facilities and sites located throughout the City. Facilities such as Henry Law Park, the adjacent Butterfield gymnasium and the skateboard/inline skate park on River Street are easily accessible by foot or bicycle although traffic and parking can be difficult when accessing by automobile. Some facilities, such as the baseball park off of Sixth Street, are more peripheral to the urban core and are also somewhat easily reached by various modes of travel. Other locations include Garrison Hill, with its relatively significant elevation providing excellent views of the City and pleasant walking trails. Access to the Cochecho River is available in numerous locations and canoes and other water going vessels are often seen on a sunny summer afternoon on the waters.

Perhaps one of the most important aspects of Dover's recreation facilities is that they are dispersed over various locations throughout the City. This has multiple benefits.

From the standpoint of ease of access, they are in proximity to the urban core and often accessible by more than one mode of transportation. Some locations can be reasonably reached by bicycle, foot, automobile or transit. Having recreation facilities located in this decentralized fashion also keeps traffic demands placed on any one facility to a reasonable level. If all facilities were located at one centralized facility, traffic and parking demands would become severe at times when multiple events are scheduled.

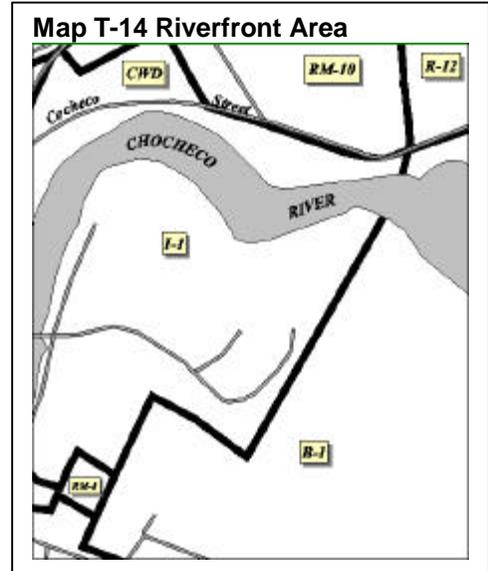
The City may wish to modify existing recreation facilities to improve access, safety and adjacent traffic operations to a small extent, but it should follow the course of having them placed at various locations around the city for optimal accessibility and minimal traffic headaches.

Conclusions and Recommendations

- *Continue to encourage decentralized recreation facilities in an effort to minimize cumulative traffic impacts.* By having many separate facilities, no one location becomes a major traffic generator. This reduces the need to make major investments in roadway infrastructure often associated with large recreation facilities. If centralized facilities are developed, funding for impact mitigation measures should be included in the capital costs of constructing the facility.
- *Coordinate with the School Department in order to ensure all planning efforts for transportation facilities serve the needs of the schools when appropriate.* For instance, many of the City's plans for bicycle and pedestrian trails directly or indirectly serve the schools. For maximum positive project impacts, there needs to be involvement of the School Department in the development of these plans.

New Development Zones requiring Transportation Infrastructure Decisions

City staff has identified four areas that face major transportation infrastructure investment decisions by City officials. Three of these areas are the result of recent zoning changes and one is a result of a major change in use. This section identifies those areas in summary, highlights the transportation infrastructure choices and lays out effects of potential policy and investment decisions. Over the next several years, the Planning Board and City Council will need to arrive at consensus for the long-term benefit of the City. This section limits itself to transportation infrastructure investment issues and resource review.



Riverfront Redevelopment

The departure of the Public Works garage from the eastern shores of the Dover Riverfront presents a

Dover Zoning District Key

Residential

- R-40 Rural Residential District
- R-20 Low-Density Residential District
- R-12 Medium-Density Residential District
- RM-20 Suburban Density Multiresidential District
- RM-12 Low-Density Multiresidential District
- RM-10 Medium-Density Multiresidential District
- RM-8 High-Density Multiresidential District
- RM-6 Urban Density Multiresidential District

Nonresidential

- O Office District
- B-1 Neighborhood Business District
- B-2 Central Business District
- B-3 Thoroughfare Business District
- B-4 Hotel/Retail District
- B-5 Rural Commercial/Retail District

(Added 11-22-95 by Ord. No. 19-95)

- I-1 Restricted Industrial District
- I-2 Rural Restricted Industrial District
- I-4 Assembly and Office
- ETP Executive and Technology Park
- UMUD Urban Multiple Use District
- CWD Cochecho Waterfront District

Overriding

- CD Conservation District
- URD Urban Renewal District
- GWP Groundwater Protection District
- HWD Hazardous Waste Landfill District
- TDR Transfer of Development Rights

(Added 04-03-91 by Ord. No. 01-91)

- WPD Wetland Protection District
- 170-18

Source: DoverNet - City of Dover Website

unique opportunity for coordinated redevelopment of a large, high profile section of downtown Dover. Critical to the success of this venture is the provision of new transportation infrastructure focused on access, mobility and connection with the downtown. The uses chosen for the riverfront should include mixed use, residential and destination development that will provide a livable and active setting.

Dover has enjoyed a long and prosperous relationship with the Cochecho River. The site of early settlements, trade and industry in the area and the City is once again looking to the riverfront as an activity center of the community. Several proposals have been submitted to redevelop a 33-acre parcel of City-owned land off River Street and establish a waterfront park and commercial center. An initial Chamber of Commerce- and City-sponsored study prepared two conceptual approaches to redevelopment in July 1996. Subsequent proposals under consideration include a hotel, a marina, and an aquarium/science center complex. Other options include an amphitheater, a city wharf, various housing development proposals, and a shore-side bicycle/pedestrian path. A 28- to 32- unit condominium complex off Paul Street is being designed and awaits submission to the Planning Board for approval.

In 1999, the City Council approved funds to relocate the Public Works garage. This will facilitate the redevelopment process. The footprints left behind from this facility, as well as an old relocated water treatment facility, will serve as outlines for new construction.

Water Transportation

The City, in the redevelopment of the waterfront area, also has the opportunity to add to the mix of transportation modes it currently enjoys. The river currently serves recreational boating enthusiasts but it also has the potential to serve as a legitimate transportation facility connecting with other municipalities in the region. Access is possible, via water, south to Little Bay and to the Portsmouth and Newington areas, and it also connects to points north in Maine.

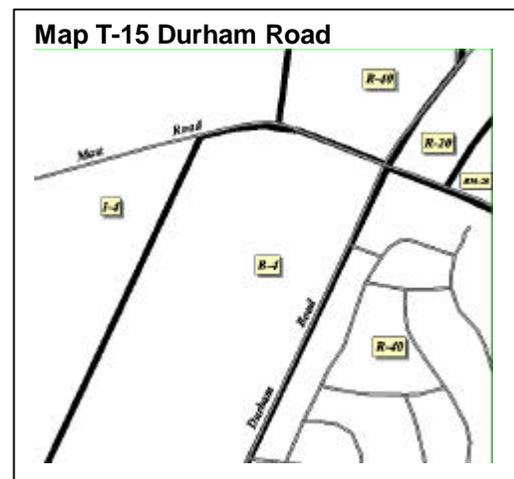
The City, in the past, has taken part in discussions regarding the establishment of such services. These conversations have been mostly geared towards the long-term. However, as the City works to redesign the waterfront, and the area becomes more active with attractions such as public recreation facilities, a marina, and other facilities yet to be determined, this possibility of water transportation becomes more of a reality.

Water transportation will require funding sources other than those typically used for surface transportation and discussed elsewhere in this chapter. Federal surface transportation funds would likely only be accessible for facilities on the land itself, and limited at that. For any water service itself, such as a "water taxi" that might make trips in between Dover and Portsmouth, the City should keep in mind public/private partnerships that may provide needed funds for the operation of such a service. The City should also make provisions in the development of the waterfront for public access and docking of such services, rather than letting all waterfront land serve as private access for residents and private business, as the waterfront area is currently planned for.

Durham Road (NH 108) southwest of Mast Road.

The southwest quadrant of the NH 108 and Mast Road intersection offers Zone B-4 (rezoned in 1998) land for development in Dover. The City has several options for public or public/private cooperative development regarding transportation infrastructure improvements.

The City could consider designating Highway Planning Corridors per RSA 230:A and cooperative infrastructure investments for a new internal, interconnected street system with full connectivity to the existing road network. The majority of trips might be directed towards the existing signalized intersection via an upgrade with turning lanes and intelligent signals. Commercial traffic should be discouraged from additional NH 108 access.

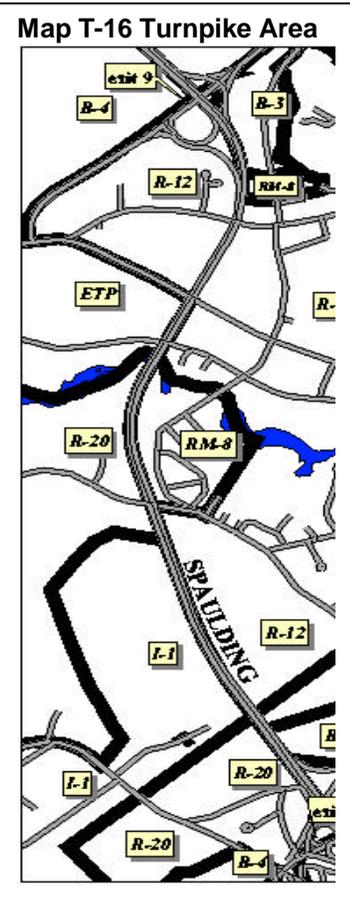


Additionally, the NH 108 section should include full bicycle, sidewalk and transit amenities. The development of this section should ensure full compatibility with the existing residential neighborhoods to allow for non-vehicular mobility.

The most likely funding mechanisms for this development are City bonding authority, developer contributions and direct municipal contribution. It is unlikely that any traditional transportation funds (Federal or State) can assist with this improvement.

Spaulding Turnpike Corridor between Exit 8 and Exit 9

The existing stretch of land adjacent to the turnpike between Exit 8 and 9 offers development potential to the City, but features many challenges from a fiscal and transportation standpoint. Bisected by the Boston-Portland Rail line and paralleled by the NH 9 corridor, the area features several large tracts of land that are underutilized or recently developed into residential subdivisions.



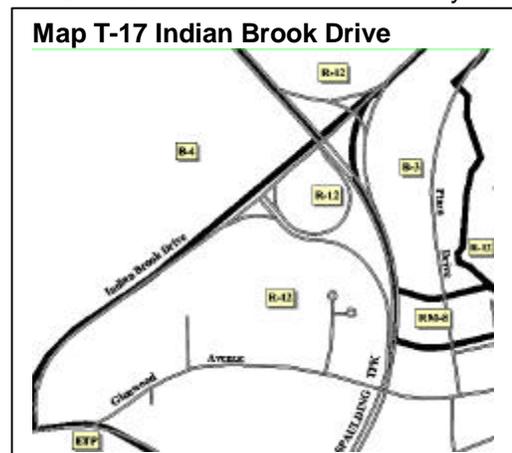
The City has long evaluated the potential for an Exit 8A with southbound on-off access which would provide a direct connection to NH 9 and to the industrial areas of Crosby Road and the Southeastern Industrial Park. This evaluation should be continued, but with additional caveats.

The Strafford region lacks a first class park and ride intermodal facility. This stretch of the Spaulding corridor is one of the most logical spaces for such a facility. The City should work with NHDOT and the SRPC to evaluate whether a park and ride facility would provide access options for future industrial development. Any intermodal facility should have direct access to the turnpike as well as direct transit access, via existing carriers of the downtown trolley, to the downtown intermodal station and center.

The City should view these areas for industrial expansion and should work to develop viable, appropriate access – a possibility includes evaluating a new access roadway parallel to the turnpike beginning at a point off the existing Cambridge Tool access road which is located off NH Route 9- Littleworth Road and is parallel to the B&M Main Rail Line and the existing industrial park. Any parallel access roadway constructed should connect to the turnpike if the intermodal site with an interchange were constructed.

Exit 9 Indian Brook Drive (formerly known as the Sixth Street Connector)

With the completion of the Weeks Crossing and likely improvements of Exit 9, the City needs to carefully review its long-term plans for Indian Brook Drive on the southwest side of the turnpike. This area abuts industrial zones and allows for some commercial access. The City should develop a street network that would connect Indian Brook Drive with the internal network of the Dover Enterprise Park. Major access should be funneled to the County Farm Intersection that will become signalized and a connector in the shared Northeast Federal Credit Union area. Again, the City should design an interconnected system of streets that will preserve open space and resist the temptation for commercial strip development. A commercial node at the corner of Sixth and Indian Brook Drive may be warranted to provide services for residents and employees in the western Dover area. In 1991, the City conducted a study of these issues. This should be referenced as implementation of this concept approaches. This development may offer a long-term opportunity to rebuild and reconnect the County Farm Road Bridge to Rochester.



Recommendations - Riverfront

The City has a great opportunity with this riverfront area to enhance the downtown. An ideal choice for development here will balance the historical significance of the riverfront in Dover, the economic potential of the land, environmental concerns, and serve the people of the City in providing a place they can be proud of.

- *Continue efforts to find suitable redevelopment plans and designs appropriate for the unique qualities of this parcel of land. Waterfront portions of other cities have proven to be hugely successful in promoting downtown activity including tourism, the State of New Hampshire's largest revenue source. Dover should proceed carefully as they decide what mix of uses to promote on this land.*
- *Pursue construction of the Washington Street Bridge over the Cochecho River. This project needs to become a priority for the city. It would complement the pedestrian access bridge. This investment will necessitate a complete review of the downtown traffic pattern including a study of the one-way street system around the downtown "loop". Promote Interconnected street design that encourages low-speed, unsignalized flow. Reestablishment of this bridge may lead to a need for two-way traffic patterns in some portions of the downtown.*
- *Design for the continuation of the River walk and full bicycle and pedestrian access along all new riverfront development.*
- *Design a new street network on the riverfront property that is in scale with the historical street design of the city, focused on livable streetscapes and constructed with a first class sidewalk system.*
- *Provide full accommodation in the design for the planned Dover Downtown trolley system including pullouts and integral bus shelter center.*
- *Implement improvements to Henry Law Avenue, including full sidewalks and reconstruction of the street to accommodate all users in a speed-controlled setting using cost-effective, appropriate traffic calming techniques.*

Recommendations - Durham Road

- *Be cognizant of access and safety issues first and foremost when supporting any expansion of industrial uses in any future rezoning and redevelopment of these areas, and in the City in general.*
- *Preemptively design access management plans designating Highway Access Corridors per RSA 230 for the roadway sections adjacent to the parcels of land proposed for rezoning above. This technique will ensure acceptable function of the roadways for both local and through traffic. (For more on this topic, see the Access Management section of this chapter.)*

Recommendations - Spaulding Turnpike Corridor

- *Be cognizant of access and safety issues first and foremost when supporting any expansion of industrial uses in any future rezoning and redevelopment of these areas, and in the City in general.*
- *Integrate and coordinate plans for access to this land with plans to work with NHDOT in the implementation of a park and ride location in this area in coordination with plans for a separate*

parallel access road. Both facilities should be linked if constructed. (For more on this topic, see the Ridesharing and Vehicle Trip Reduction section of this chapter.)

- *Preemptively design access management plans for the roadway sections adjacent to the parcels of land proposed for rezoning above using the Highway Access powers under RSA 230. Such access would begin at an appropriate point off the Cambridge Tool Access Road or the turnpike. The City should also work toward eventual construction using fair share contributions with users and the State. This technique will ensure acceptable function of the roadways for both local and through traffic. (For more on this topic, see the Access Management section of this chapter .)*

Recommendations - Indian Brook Drive

- *Be cognizant of access and safety issues first and foremost when supporting any expansion of industrial uses in any future rezoning and redevelopment of these areas and in the City in general.*
- *Refer to the 1991 study of this area to integrate previous planning efforts and designs into the road layout process.*
- *Preemptively design access management plans for the roadway sections adjacent to the parcels of land proposed for rezoning above. This technique will ensure acceptable function of the roadways for both local and through traffic. (For more on this topic, see the Access Management section of this chapter.)*